Oral & Poster Presentations

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Count: 1
Abstract ID: 511
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effect of magnesium and exercise on the spatial learning and memory in the Wistar rats: the role of BDNF protein

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Background and Aim : Introduction: Magnesium has been found to have neuroprotective properties and can improve memory and learning in preclinical models of aging, traumatic brain injury, drug addiction, glutamate neurotoxicity, and Alzheimer's disease. Regular physical exercise (EX) is considered to be the most powerful non-pharmacological approach for promoting optimal brain health. Given the findings of previous research, it is hypothesized that moderate-intensity exercise and lithium treatments could promote improvements in spatial learning and memory in Wistar rats by activating brain-derived neurotrophic factor (BDNF) in the hippocampus. This study evaluated the role of BDNF in the effects of lithium and exercise on spatial learning and memory.

Methods : In this research, 28 male Wistar rats were divided into 4 groups; I: Control (Crt), animals did not receive drug; II: Mg (40 mg/kg/day/ip); III: Moderate-intensity training (MIT); IV: Mg and MIT (Mg+ MIT); One hour after the last injection, the Morris water maze (MWM) test was conducted. Moreover, the density of BDNF (brain-derived neurotrophic factor) was assessed by the ELIZA method.

Results : Our result showed the beneficial effects of exercise on spatial learning and memory; however, magnesium administration alone cannot affect this. Additionally, exercise-exposed and magnesium administration combined rats did not show change in spatial learning and memory. Finally, we observed a positive role of BDNF protein in the exercise effects.

Conclusion : Our result showed the beneficial effects of exercise on spatial learning and memory; however, magnesium administration alone cannot affect this. Additionally, exercise-exposed and magnesium administration combined rats did not show change in spatial learning and memory. Finally, we observed a positive role of BDNF protein in the exercise effects.

Keywords : magnesium, exercise, MWM, BDNF

Count: 2
Abstract ID: 192
subject: Cognition: Learning and Memory
Presentation Type: Oral

Amyloid β-induced LTP impairment accompanied by hippocampal Aralkylamine N-Acetyltransferase activity attenuation

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Background and Aim : Melatonin is a methoxyindole secreted mainly, but not exclusively by the pineal gland. Several studies have been reported the presence of melatonin rate limiting enzyme, aralkylamine N-acetyltransferase (AANAT), in the hippocampus. On the other hand, melatonin level is decilned in neurodegenerative cognitive impairment . The aim of this study was to invstigate whether the rate-limiting enzyme of melatonin synthesis in hippocampus is affected by the ICV-Aβ injection

Methods : after bilateral intra-cerebroventricular injection of Aβ, the long-term potentiation (LTP) was evaluated using local field potential recording. Western blot technique was carried out in order to measure the hippocampal AANAT activity.

Results : unchanged population spike amplitude in Aβ group in comparison to sham group confirmed LTP impairment. These alterations were in parallel with a significant hippocampal AANAT activity reduction.

Conclusion : It seems that the local AANAT activity reduction is in accordance with LTP impairment in animal model of Alzheimer's disease. These data suggest the importance of considering the local melatonin alteration to find the molecular mechanism of pathological condition such as AD

Keywords : Arylalkylamine N Acetyltransferase ; Alzheimer's disease ; Hippocampus ; Long-term potentiation ; Melatonin ; Morris's water maze

Count: 3
Abstract ID: 221
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Role of Glutamatergic AMPA Receptors in the Lateral Habenula during the Acquisition and Expression Phases of Morphine-Induced Place Preference

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Background and Aim : The lateral habenula (LHb), a brain structure within the epithalamic region, is recognized for its significant involvement in depression and drug addiction. Morphine reward primarily hinges on the glutamatergic system. However, the impact of activating or inhibiting AMPA-type glutamate receptors (AMPARs) within the LHb on different aspects of morphine-induced conditioned place preference (CPP) remains a topic of uncertainty. In this study, we delved into the effects of bilateral microinjections of AMPARs agonists and antagonists within the LHb on both the acquisition and expression phases of CPP in male rats.

Methods : During the conditioning sessions of the acquisition phase, we administered bilateral injections of AMPARs agonists and antagonists. In separate groups, we also administered the drugs into the LHb just 5 minutes prior to the test phase in the expression phase of CPP. Wistar rats were the subjects in this experiment.

Results : The acquisition phase of CPP saw an increase in the CPP score when various doses of NBQX, an antagonist of AMPARs, were combined with an effective dose of morphine. Conversely, during the acquisition phase, the administration of AMPA, an AMPARs agonist, notably decreased the conditioning scores. Notably, pretreatment with NBQX only reversed the reduction in CPP caused by AMPA at a dose of 1µg per rat in the acquisition phase of morphine-induced CPP. However, the antagonist couldn't alter the impact of a high dose of the agonist (1µg per rat) on CPP.

Conclusion : Moving to the expression phase, NBQX significantly increased CPP scores, while AMPA had no substantial effect on CPP scores during this phase but did significantly reduce motor activity in the test phase.

Keywords : Rat, CPP, Locomotor activity, Lateral habenula, AMPA

Count: 4
Abstract ID: 33
subject: Cognition: Learning and Memory
Presentation Type: Oral

Geraniol improves passive avoidance memory and hippocampal synaptic plasticity deficits in a rat model of Alzheimer's disease

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Background and Aim : Alzheimer's disease (AD) is the most progressive and irreversible neurodegenerative disease that leads to synaptic loss and cognitive decline. The present study was designed to evaluate the effects of geraniol (GR), a valuable acyclic monoterpene alcohol, with protective and therapeutic effects, on passive avoidance memory, hippocampal synaptic plasticity, and amyloid-beta (Aβ) plaques formation in an AD rat model induced by intracerebroventricular (ICV) microinjection of Aβ1-40.
Methods : Seventy male Wistar rats were randomly into sham, control, control-GR (100 mg/kg; P.O. (orally), AD, GR-AD (100 mg/kg; P.O.; pretreatment), AD-GR (100 mg/kg; P.O.; treatment), and GR-AD-GR (100 mg/kg; P.O.; pretreatment & treatment). Administration of GR was continued for four consecutive weeks. Training for the passive avoidance test was carried out on the 36th day and a memory retention test was performed 24 h later. On day 38, hippocampal synaptic plasticity (long-term potentiation; LTP) was recorded in perforant path-dentate gyrus (PP-DG) synapses to assess field excitatory postsynaptic potentials (fEPSPs) slope and population spike (PS) amplitude. Subsequently, Aβ plaques were identified in the hippocampus by Congo red staining.
Results : The results showed that A? microinjection increased passive avoidance memory impairment, suppressed of hippocampal LTP induction, and enhanced of A? plaque formation in the hippocampus. Interestingly, oral administration of GR improved passive avoidance memory deficit, ameliorated hippocampal LTP impairment, and reduced A? plaque accumulation in the A?-infused rats.
Conclusion : The results suggest that GR mitigates Aβ-induced passive avoidance memory impairment, possibly through alleviation of hippocampal synaptic dysfunction and inhibition of Aβ plaque formation.
Keywords : Alzheimer's disease Geraniol Passive avoidance memory Long-term potentiation Rat

Count: 5
Abstract ID: 49
subject: Cognition: Learning and Memory
Presentation Type: Poster

MRI-based Study on the Effect of Cognitive Narrative Therapy in Improving the Language Skills of Autistic Children

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Background and Aim : In terms of psychosocial wellbeing, language skills have an indispensable role on the quality of communication. The aim of this study was to assess the effect of cognitive narrative therapy in children with autism based on the findings of brain MRI scans.
Methods : This quasi-experiment included a pre- and post-assessment. The study was performed on both experimental and control groups (each group including 10 children). Among qualified children, 20 children aged between 8-12 years were selected using convenience sampling. The children in the experimental group underwent therapy for 20 sessions and their brain MRI were recorded at the end of sessions 10 and 20. In this study, the level of improvement was measured using Gilliam Autism Rating Scale (GARS). The obtained data were analyzed using covariance.
Results : the findings of MRI scans revealed that the cognitive narrative therapy has a substantial effect ($p<0.01$) on reducing the language disorder symptoms and improving the speech and communication abilities of individuals in the experimental group compared to the control group. The evidence of improvement was clearly detectable in the brain MRI of individuals in the experimental group. This positive modification was more pronounced in regions associated with receptive and expressive languages such as the posterior lobe of cerebellum, motor cortex and dorsal attention network. This per se, significantly promotes the speech of the individuals in the experimental group. For instance, the therapy significantly improved the usage of conjunctions, as well as simple and compound sentences. The comparison of MRI scans recorded at sessions 10 and 20 indicated that increased number of therapy sessions promotes the recovery (evidenced by remarkable volumetric increase of the regions related to the receptive and expressive languages).
Conclusion : This study demonstrated that cognitive narrative therapy has a marked influence on improving the language and communication abilities of autistic children. Given the distinguished MRI results obtained at mid (10) and final (20) therapy sessions, it can be recommended to continue the therapy for 20 sessions. In the future studies, the effect of therapy over a longer period (more than 20 sessions) can also be evaluated on clinical symptoms and brain MRI of autistic patients.
Keywords : Autism, Cognitive narrative therapy, Brain MRI, Language skills

Count: 6
Abstract ID: 261
subject: Cognition: Learning and Memory
Presentation Type: Poster

Omega-3 fatty acids prevent nicotine withdrawal-induced impairment of learning and memory via affecting oxidative status, inflammatory response, cholinergic activity, BDNF and amyloid-B in rat hippoca

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Background and Aim : In the present study, the main objective was to reveal whether treatment by Omega-3 fatty acids could prevent the adverse effects of adolescent nicotine withdrawal on spatial and avoidance memory in male rats.

Methods : For this purpose, Morris water maze and passive avoidance tests were performed on male Wistar rats and the hippocampal levels of oxidative stress markers, inflammatory indices, brain-derived neurotrophic factor, nitrite, amyloid-B and acetylcholinesterase (AChE) were measured. Moreover, density of dark neurons were assessed in CA1 and CA3 regions.

Results : Results showed that adolescent nicotine exposure followed by a period of drug cessation exacerbates the behavioral indices of learning and memory through affecting a variety of biochemical markers within the hippocampal tissues. These changes lead to elevation of oxidative and inflammatory markers, reduction of neurotrophic capacity and increased AChE activity in hippocampal tissues. In addition, it was observed that co-administration of nicotine with Omega-3 fatty acids significantly prevents nicotine withdrawal-induced adverse effects through restoration of the mentioned biochemical disturbances.

Conclusion : Therefore, we suggest administration of Omega-3 fatty acids as a safe, inexpensive and effective therapeutic strategy for prevention of memory dysfunctions associated with nicotine abstinence during adolescence.

Keywords : Nicotine; adolescent; Omega-3; inflammation; dark neurons; BDNF.

Count: 7
Abstract ID: 218
subject: Cognition: Learning and Memory
Presentation Type: Poster

Transgenerational effects of morphine administration during adolescence on passive avoidance learning and memory

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Background and Aim : The use of opioids has been reported as a common and ordinary act in adolescents and young adults. In rats, the days 28-42 after birth are the early-mid adolescence (equivalent to ages of 12-17 in humans) and the days 43-55 after birth, are known as the late adolescence phase or the beginning of adulthood (equivalent to ages of 18-25 in humans). Inheritance of epigenetic states enables the parent to transfer the information related to their ancestors' environment, including drug use, to their offspring. The current study examined the intergenerational effects of paternal morphine exposure during adolescence on passive avoidance learning and memory.

Methods : In this study, male Wistar rats were exposed to increasing doses of morphine (5-25 mg/kg, s.c.) or saline for 10 days during adolescence (PND, postnatal day, 30-39). Following a 20-days drug-free period, the treated male rats were mated with naïve females. Adult male offspring (PND 60-75) were tested for passive avoidance learning and memory using shuttle box. Habituation trial: Animals were placed in the light compartment and five seconds later, the guillotine door was raised. After the rat entered the dark compartment, the door was closed and 20 seconds later, the animal was taken from the dark compartment. Training trial: The rats were placed in the light compartment in each session. Five seconds later, the guillotine door was raised. After the animal entered the dark compartment, the door was closed and after 3 seconds, an electrical shock with a constant current intensity (0.5 mA) was delivered through the grid floor. 20 seconds later the animal was taken from the dark compartment. Training trials were repeated every 2 minutes until the rat stayed in the light compartment for 120 seconds. Retention test: The retention test was performed 24 h after training trials. The animal was placed in the light compartment and 5 seconds later, the guillotine door was raised. The retention test is terminated if the animal does not enter the dark compartment within 300 seconds.

Results : It was observed that Step-through latency (latency for entering the dark compartment) was significantly less in morphine-sired males compared to the saline-sired ones in the retention

test, which indicates a deficit in passive avoidance memory. In addition, trial number (the number of learning sessions) was significantly more in morphine-sired group during the training trials, which indicates that their passive avoidance learning was disrupted and they need more sessions to learn the test.

Conclusion : Paternal exposure to morphine during adolescence disrupted passive avoidance learning and memory in male offspring.

Keywords : Adolescence; Opiate, Offspring; Learning; Memory; Hippocampus

Count: 8
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subject: Cognition: Learning and Memory
Presentation Type: Poster

Dorsal hippocampal CA1 NMDA receptors mediate the interactive effects of quetiapine and lithium on memory retention in male rats

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Background and Aim : Lithium and quetiapine are administered simultaneously as a treatments for bipolar disorder. The concurrent use of these two drugs has been observed to affect the neurobiological mechanisms underlying learning and memory. To clarify the precise mechanisms involved, we evaluated the possible role of the dorsal hippocampal CA1 NMDA receptors in the interactive effects of lithium and quetiapine in memory consolidation.

Methods : The dorsal hippocampal CA1 regions of adult male Wistar rats were bilaterally cannulated, and a single-trial step-through inhibitory avoidance apparatus was used to assess memory consolidation.

Results : Post-training administration of certain doses of lithium (20, 30, and 40 mg/kg, i.p.) diminished memory consolidation. Post-training administration of higher doses of quetiapine (5, 10, and 20 mg/kg, i.p.) augmented memory consolidation. Post-training administration of certain doses of quetiapine (2.5, 5, 10, and 20 mg/kg) dose-dependently restored lithium-induced memory impairment. Post-training microinjection of ineffective doses of the NMDA (10-5 and 10-4 µg/rat, intra-CA1) plus an ineffective dose of quetiapine (2.5 mg/kg) restored the lithium-induced memory impairment. Post-training microinjection of ineffective doses of the noncompetitive the NMDA receptor antagonist, MK-801 (0.0625 and 0.0125 µg/rat, intra-CA1), diminished the quetiapine-induced (10 mg/kg) memory improvement in lithium-induced memory impairment.
Conclusion : These findings suggest a functional interaction between lithium and quetiapine through hippocampal CA1 NMDA receptor mechanisms in memory consolidation.
Keywords : Lithium, Quetiapine, NMDA, MK-801, Dorsal hippocampus

Count: 9
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subject: Cognition: Learning and Memory
Presentation Type: Poster

Spleen Tyrosine Kinase (Syk): an Element That Can't Be Ignored in Alzheimer's disease (AD) Pathology

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INTRODUCTION: please rewrite this passage: Alzheimer's disease (AD) is a complex neurodegenerative disorder characterized by the accumulation of pathological hallmarks, such as amyloid-beta (Aβ) plaques, tau protein hyperphosphorylation, neuroinflammation, and impaired autophagy. Recent research has highlighted the pivotal role of Spleen Tyrosine Kinase (Syk) an enzyme involved in immune cell signaling in AD pathology. syk plays a crucial role in regulating immune responses and has been implicated in various diseases, including autoimmune disorders and certain types of cancer. METHOD: Research materials were extracted from at least 17 articles using the following databases: Science Direct, Google Scholar, Medline, and PubMed using the keywords: Alzheimer, Spleen Tyrosine Kinase, Amyloid-beta, tau hyperphosphorylation, and autophagy RESULT: Amyloid-beta (Aβ) production stands at the core of Alzheimer's disease (AD) pathogenesis, and Syk triggers downstream signaling pathways, notably the γ-secretase pathway. This pathway plays a pivotal role in the cleavage of the amyloid precursor protein (APP) and the subsequent generation of Aβ peptides. Additionally, Syk is a key player in the signaling cascades that amplify the neuroinflammatory response, contributing to neurodegeneration, a process in which microglia's involvement cannot be underestimated. Furthermore, Syk is implicated in the hyperphosphorylation of tau, a defining characteristic of neurofibrillary tangles. Activation of Syk amplifies the activity of kinases, including glycogen synthase kinase 3β (GSK-3β) and cyclin-dependent kinase 5 (CDK5), both responsible for the aberrant phosphorylation of tau. Autophagy, a vital cellular process responsible for protein and organelle degradation, is impaired in AD. Syk disrupts autophagy by impeding autophagosome formation and lysosomal function, leading to the accumulation of damaged proteins and organelles. The restoration of autophagy through Syk inhibition may offer a potential means to clear toxic aggregates in AD. CONCLUSION: In summary, Syk serves as a multifaceted contributor to the pathogenesis of Alzheimer's disease, influencing Aβ production, neuroinflammation, tau phosphorylation, and autophagy dysfunction. Targeting Syk presents a promising avenue for therapeutics to address various facets of AD pathology, offering hope for future research and drug development in the battle against Alzheimer's disease.

Keywords : Alzheimer, Spleen Tyrosine Kinase, Amyloid-beta, tau hyperphosphorylation, autophagy

Count: 10
Abstract ID: 636
subject: Cognition: Learning and Memory
Presentation Type: Oral

Effects of nano-curcumin on noise stress-induced hippocampus-dependent memory impairment: behavioral and electrophysiological aspects

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Background and Aim : Noise pollution is one of the fundamental factors in the etiology of many disorders. Noise stress adversely affects cognitive behaviors and long-term potentiation (LTP), the candidate mechanism of learning and memory. In the present study, we examined the neuroprotective effects of nano-curcumin on behavioral and electrophysiological aspects of hippocampus-dependent memory in noise-exposed animals.

Methods : The stressed animals received either vehicle (ST) or nano-curcumin (NANO + ST) for 2 weeks. The control groups remained either intact (CON) or received nano-curcumin (NANO + CON). The ST and NANO + ST groups were exposed to daily noise for 2 weeks. The spatial memory was assessed in the Morris water maze. The LTP was investigated through field potential recording in the CA3–CA1 pathway of the hippocampus. Serum corticosterone level was measured at the end of the experiments.

Results : The ST group showed a lower cognitive function and suppressed LTP compared to the CON group. The nano-curcumin treatment improved the maze navigation and LTP induction compared to the ST group. While the stress exposure elevated the serum level of corticosterone in the ST animals, nano-curcumin treatment reduced it.

Conclusion : The nano-curcumin treatment restores impaired behavioral and electrophysiological aspects of learning and memory in the noise-exposed animals. The plasma corticosterone levels may be associated with changes in cognitive behavior and synaptic plasticity.

Keywords : Nano-curcumin, hippocampus, memory, behavior, electerophysiology

Count: 11
Abstract ID: 353
subject: Cognition: Learning and Memory
Presentation Type: Poster

Transplanted mesenchymal stem cells affect spatial memory in rat model of Alzheimer's disease

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Background and Aim : Alzheimer's disease (AD) is a neurodegenerative disorder that impairs mental ability development and interrupts neurocognitive function. Despite of many years of research, there is no effective treatment. Stem cell therapy represents a fascinating new approach for the management of degenerative disorders.

Methods : 28 male Wistar rats were divided into 4 groups (n=7): Control, Sham, Alzheimer's disease model, cell therapy. The nucleus basalis of Meynert (NBM) was bilaterally destroyed using electrical lesion (0.5 mA for 3 s) in 3th and 4th groups. Sham did not undergo electrical lesion. One week after the induction of Alzheimer's disease model, the mesenchymal cells (0.1 mL) were injected with stereotaxic surgery using a Hamilton syringe at NBM and after three weeks spatial memory was study by using Y maze.

Results : our results showed significant impairment of spatial memory ($p<0.01$) after electrical lesion in Alzheimer's group in compare with control and sham. Transplantation of stem cells improved spatial memory of cell therapy group in compare with Alzheimer' ($p<0.01$).

Conclusion : Based on the results obtained from the present study and the cell differentiation studies of other colleagues, it can be said that stem cells have a high ability to repair damaged tissue through differentiation into the specialized cells of the tissue in which they are implanted.

Keywords : Mesenchymal stem cell, Alzheimer's disease, Spatial memory

Count: 12
Abstract ID: 345
subject: Cognition: Learning and Memory
Presentation Type: Poster

Oral supplementation of ascorbic acid improves learning and memory impairment induced by adolescent stress exposure in male rats: behavioural, biochemical and electrophysiological study

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Background and Aim : The present research study aimed to investigate the role of Ascorbic acid (AA) on synaptic plasticity, learning and memory impairment induced by adolescent unpredicted chronic mild stress (CUMS) exposure in rats.

Methods : One hundred and twenty adolescent male rats were divided into following groups:1) vehicle, 2) CUMS, 3-5) CUMS plus various doses of AA (CUMS-10/100/400 mg/kg) and 6) AA400 mg/kg. After behavioral tests and electrophysiological study, they were sacrificed to analysis the biochemical response.

Results : In Morris Water Maze, the time latency decreased, while the time spent in the target quadrant increased in CUMS group treated with AA at dose of 400 mg/kg. In passive avoidance, the latency of entering into dark chamber decreased in CUMS group treated with AA (400 mg/kg). In biochemical test results, nitrite and MDA significantly decreased along with increased antioxidant parameters including thiol, SOD, and catalase activity in CUMS group received AA400mg/kg. BDNF and Ki67 increased, while AChE activity was decreased in CUMS group treated with AA simultaneously. In addition, LTP result showed AA increase amplitude and Slope reduction induced by CUMS.

Conclusion : The results of our study showed that chronic stress during adolescence could cause learning and memory disorders as well as synaptic plasticity. In addition, we showed that AA can prevent this problem by reducing oxidative stress, increasing the amount of BDNF and increasing the amount of neurogenesis.

Keywords : Chronic mild stress; Memory impairment; Ascorbic acid; Adolescent.

Count: 13
Abstract ID: 595
subject: Cognition: Learning and Memory
Presentation Type: Oral

Investigation of protective effects of coenzyme Q10 on impaired synaptic plasticity in a male rat model of Alzheimer's disease

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Background and Aim : Oxidative stress plays a key role in contributing to β-amyloid (Aβ) deposition in Alzheimer's disease (AD). Coenzyme Q10 (Q10) is a powerful antioxidant that buffers the potential adverse consequences of free radicals. In this study, we investigated the neuroprotective effects of Q10 on Aβ-induced impairment in impaired learning and memory and hippocampal long-term potentiation (LTP), a widely researched model of synaptic plasticity, which occurs during learning and memory, in a rat model of AD.

Methods : In this study, 50 adult male Wistar rats were assigned to five groups: control group (saline); sham group; intraventricular PBS injection, Aβ group; intraventricular Aβ injection, Q10 group; and Q10 via oral gavage and Q10 + Aβ group. Q10 was administered via oral gavage, once a day, for 3 weeks before and 3 weeks after the Aβ injection. After the treatment period, Novel object recognition (NOR), Morris water maze (MWM), and passive avoidance learning (PAL) tests were performed. After behavioral tests, in vivo electrophysiological recordings were performed to quantify the excitatory postsynaptic potential (EPSP) slope and population spike (PS) amplitude in the hippocampal dentate gyrus. LTP was created by a high-frequency stimulation of the perforant pathway, followed by plasma measurements to assess oxidative stress biomarkers malondialdehyde (MDA), total antioxidant status (TAC), and total oxidant status (TOS).

Results : Our data indicated that cognitive performance is impaired in A? rats. Rats in Q10 + A? + Q10 group showed improvement in behavioral impairments in spatial learning and memory, passive avoidance learning, and cognitive learning and memory. Following LTP induction, the EPSP slope and PS amplitude were significantly diminished in A?-injected rats, compared with sham and control rats. Q10 treatment of A?-injected rats significantly attenuated these decreases, suggesting that Q10 reduces the e?ects of A? on LTP. According to biochemical assessments, AD rats had a significantly higher level of MDA and TOS, whereas, in Q10 + A? + Q10 group, MDA and TOS decreased noticeably. TAC reduced significantly in AD rats, but all groups that received Q10 showed a significant difference.

Conclusion : Q10 can significantly protect brain tissue against Aβ-induced neurotoxicity in learning and memory and synaptic plasticity through its antioxidant capacity. Thus, treatment with Q10 can suppress the progression of neurodegeneration, resulting in a better quality of life in humans with AD.

Keywords : Alzheimer’s disease; Coenzyme Q10; Learning and memory; Long-term potentiation; Oxidative stress; Antioxidants

Count: 14
Abstract ID: 607
subject: Cognition: Learning and Memory
Presentation Type: Oral

Effectiveness of lacosamide on learning and memory and long-term potentiation impairment in Aβ (1–42)-induced neurotoxicity in rat model of Alzheimer's disease: a behavioral, electrophysiological, hist

Submission Author: Alireza Komaki

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Background and Aim : Alzheimer's disease (AD) as a neurodegenerative disorder can cause behavioral impairments and deficits in synaptic plasticity due to oxidative stress. Considering the mechanisms involved in AD and the neuroprotective, antioxidant, and anti-apoptotic effects reported from lacosamide (LCM) which is an antiepileptic drug, the aim of this study is to investigate the role of LCM On Aβ-induced impairments in learning and memory, hippocampal synaptic plasticity (long term potentiation), oxidative stress, number of pyramidal cells in CA1 region, and Aβ plaque in AD model rats.

Methods : In this study, 64 adult male Wistar rats were randomly assigned to eight groups (n=8 rats/group); Group1 (Control), Group2 (LCM), Group3 (Vehicle), Group4 (PBS+LCM), Group5 (Aβ), Group6 (LCM+Aβ), Group7 (Aβ+LCM), and Group8 (LCM+Aβ+LCM), in experimental groups LCM (30 mg/kg in distilled water) was administered via oral gavage, once a day, for 4 weeks before and 4 weeks after the Aβ1-42 (5 μL; ICV) injection. After treatments, Morris water maze (MWM), novel object recognition (NOR), and passive avoidance learning (PAL) tests were used to assess the animals' behavior. After the behavioral tests, in vivo electrophysiological recordings were performed to quantify the excitatory postsynaptic potential (EPSP) slope and population spike (PS) amplitude in the hippocampal dentate gyrus (DG). Long-term potentiation (LTP) was created by a high-frequency stimulation of the perforant pathway. At the end of the

research experiments, plasma measurements were performed for malondialdehyde (MDA), total antioxidant capacity (TAC), and total oxidant status (TOS), also Thioflavin S staining was used to show Aβ plaque aggregation in the hippocampus. Hematoxylin and eosin staining was used to check the effects of LCM administration on the number of pyramidal cells in the CA1 region of the hippocampus.

Results : Aβ microinjection increased learning and memory deficits in MWM, NOR, and PAL tests, and neuronal loss in the CA1 region. Interestingly, administration of LCM improved behavioral deficits and neuronal loss in the Aβ-infused rats. After induction of LTP, PS amplitude and EPSP slope were significantly decreased in Aβ-injected rats, compared with vehicle and control rats. LCM treatment of Aβ-injected rats significantly attenuated these decreases, suggesting that LCM reduces the effects of Aβ on LTP. Also, Aβ significantly increased serum MDA levels and TOS levels, whereas LCM significantly reversed these parameters and increased TAC levels. In histological results, the formation of Aβ plaque in the hippocampus of group 5 increased significantly compared to groups 1,2,3, and group 4, but group 8 showed decreased Aβ plaques compared to group 5.

Conclusion : Our findings suggest that LCM ameliorates behavioral and hippocampal synaptic plasticity impairments through a decrease in oxidative stress and neuronal degeneration.

Keywords : Alzheimer’s disease, Lacosamide, Neuroprotective, Learning and memory, Synaptic plasticity, Aβ plaque

Count: 15
Abstract ID: 332
subject: Cognition: Learning and Memory
Presentation Type: Oral

Substantial increase in the social memory interaction by cell-free serum therapy in C/57 mice model of mPFC ischemia

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Background and Aim : Acute ischemic stroke is often associated with functional disability and cognitive impairment, for which there is currently no effective treatment to prevent brain damage. Recently, cell-free serums have been studied for their potential to promote neuronal survival in brain disorders due to the abundance of anti-inflammatory cytokines and neurothrophic factors they contain.

Methods : Bilateral photothrombotic mPFC ischemia was induced under isoflurane anesthesia. Ischemia induction was approved with TTC staining 48h after surgury. we assessed the influence of intranasal administration of serum, seven days post-ischemic stroke induction, on social ineraction test and anti-inflammatory marker IL-1β. The control,sham and ischemic groups received normal saline (NS) while the treatment groups were administered serum.

Results : Based on the obtained results, there was no significant difference in the locomotor activity, assessed by the total traveled distance and sociability index among six groups. social memory in the NS group was significantly decreased as compared to the control and Sham groups. Nonetheless, serum therapy has caused a significant increase in the social interaction index suggesting a substantial increase in the social memory in treatment groups.IL-1β expression increased in NS group compared to Control and Sham groups. Serum-recieving groups showed decreased level of IL-1β synthesis through the western-blott analysis.

Conclusion : The findings of this study suggest that serum therapy could be an effective translation from bench to bedside for treating ischemic stroke.

Keywords : Ischemic stroke; serum therapy; social memory

Count: 16
Abstract ID: 413
subject: Cognition: Learning and Memory
Presentation Type: Poster

Study Protocol for an Experimental Intervention in Alzheimer's Disease

Submission Author: Zahra Parastar

Zahra Parastar[1]

1. mahbube ghayournajafabadi

Background and Aim : Given the increasing prevalence of Alzheimer's disease accompanied by a discouraging progression and the current lack of effective therapeutic approaches, the need for non-pharmacological alternatives and new treatment methods that focus on improving the quality of life for individuals affected and delaying cognitive decline is crucial. Therefore, through a review and examination of therapeutic and pharmacological strategies and interventions that have been conducted thus far for this disease, a promising solution for enhancing Alzheimer's may involve harnessing virtual reality technology and integrating it with physical and cognitive activities

Methods : The rats in the intervention group, placed individually in the virtual reality environment, will navigate on the virtual reality sphere during the light cycle and, in a T-shaped spiral maze, search for a green column (cognitive cue). During their movement and in response, they will receive a reward (milk)." "They will engage in exercise twice a day, once from 11 to 13 and once from 16 to 18, for a duration of 8 weeks (6 days a week, with the specified intensity and duration)." For the first four weeks, they will exercise at a speed of 10 meters per minute in two sessions of 10 minutes each with a 2-minute break. In the fifth and sixth weeks, they will exercise at a speed of 15 meters per minute in three sessions of 10 minutes each with a 2-minute break. In the seventh and eighth weeks, they will exercise at a speed of 15 meters per minute in four sessions of 10 minutes each with a 2-minute break

Results : The current study is a kind of the protocol study and now we don't have any results

Conclusion : The current study is a kind of the protocol study and now we don't have any results

Keywords : Cognition; Alzheimer; Intervention; Rats

Count: 17
Abstract ID: 573
subject: Cognition: Learning and Memory
Presentation Type: Poster

Explore the Impacts of Global Warming and Climate Change on Human Cognition

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Background and Aim : -The potential impact of global warming and climate change on human cognition is an important area of research in the field of social challenges and clinical neuroscience. This systematic review examines original research studies that investigate aforementioned correlation. The reviewed papers explore the effects of extreme heat exposure on cognitive decline. They also examine potential disparities among different subgroups based on race/ethnicity and socioeconomic status and highlight the importance of understanding these effects, especially for people who engage in physical activities in hot environments, such as athletes, military personnel, and outdoor workers. The study aims to provide insights into the long-term impact on cognitive function and identify vulnerabilities within populations.

Methods : -A literature search was conducted in November 2023 to investigate the effects of global warming on human cognition. The search focused on studies published from 2018 to the present and utilized three databases: PubMed, Web of Science, and Scopus. The search terms included keywords related to global warming, climate change, and main aspects of cognition. The search results were refined by excluding irrelevant categories, limiting to English-language articles, and prioritizing studies involving humans. A manual search was also conducted in PubMed, combining the phrases "Global warming" and "Climate change" with each keyword, and relevant articles were selected based on their titles, resulting in the addition of 148 articles. The study specifically examined the impact of global warming on human cognition and excluded articles related to animals, air pollution, wildfires, and other conditions not directly linked to climate change. After a thorough evaluation by two individuals, a total of 16 articles were chosen for full-text review Out of the 2877 articles included in the title review process. The opinions of a third person were taken into account to address any discrepancies and finalize the selection.

Results : -These findings collectively underscore the impact of climate change on cognitive performance, mental health, and overall well-being across various populations and settings. Higher temperatures are reported to be linked to declined cognitive performance. However, it has been declared that in certain regions, lower temperature can also result in impaired cognitive performance. Studies attribute lower cognitive performance to how brain networks react to thermal stress. As featured by various papers, there is a pressing need for public health strategies, policy actions, and community interventions to enhance adaptive capacity and resilience in the face of rising temperature and climate-related challenges.

Conclusion : -The impact of climate change on human health has become a significant concern as temperatures rise. Cognitive abilities can be affected directly or indirectly, affecting people of all ages. Recent studies highlight the potential negative impact on cognitive capacity and emphasize the need for further research to understand this relationship better. Developing effective strategies to mitigate and adapt to the challenges of climate change depends on understanding this complex interaction.

Keywords : global warming, Cognition, climate change

Count: 18
Abstract ID: 597
subject: Cognition: Learning and Memory
Presentation Type: Poster

Investigating the Effects of Acupuncture and Laser Acupuncture on Memory and Learning Processes: A protocol study for A Randomized Controlled Trial

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Background and Aim : Traditional Chinese medicine(TCM) has been practiced for over three thousand years, showing positive effects on improving memory and learning. Recently, studies have been conducted on the integration of neuroscience with acupuncture.TCM and medical acupuncture literatures propose specific body and ear acupoints linked to memory and learning in the brain. This study aims to explore the efficacy of acupuncture and laser acupuncture stimulation on these identified points, utilizing functional Magnetic Resonance Imaging (fMRI) to assess changes in memory and learning processes.

Methods : A randomized controlled trial design will be implemented, comprising experimental groups for acupuncture and laser acupuncture stimulation, a control group with no stimulation, and a sham acupuncture group for rigorous comparison. Healthy adults meeting inclusion criteria will undergo pre-stimulation baseline assessments, followed by interventions during wakefulness and sleep. Post-stimulation evaluations, including cognitive tests and fMRI data analysis, will be conducted at specified intervals. Statistical analyses will compare outcomes between groups and explore correlations between fMRI data and cognitive performance.

Results : This study's methodology emphasizes the comprehensive investigation of acupuncture and laser acupuncture effects on cognitive function, integrating advanced neuroimaging techniques and a robust control framework. The inclusion of wakefulness and sleep stimulation allows for the exploration of temporal effects on memory and learning. Results from this study may provide valuable insights into potential interventions targeting cognitive function, with implications for future research and clinical applications. Ethical considerations, participant recruitment, and a

detailed statistical analysis plan enhance the scientific rigor of this exploration into the intersection of traditional medicine and modern neuroscientific methodologies.

Conclusion : This comprehensive investigation into the effects of acupuncture and laser acupuncture on cognitive function presents a methodologically rigorous approach, incorporating advanced neuroimaging techniques and a well-defined control framework. The study's focus on specific acupuncture points associated with memory and learning, along with the inclusion of wakefulness and sleep stimulation, adds depth to our understanding of the temporal aspects of cognitive enhancement. The outcomes of this research have the potential to contribute significantly to the development of interventions targeting cognitive function. As we await the study results, the prospect of an imminent revolution in the realms of learning and memory, if acupuncture proves efficacious, underscores the significance of this inquiry in bridging traditional medicine with contemporary neuroscience.

Keywords : Acupuncture, Memory, Learning,Neuroscience, fMRI

Count: 19
Abstract ID: 402
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effectiveness of Transcranial Direct Current Stimulation (tDCS) on cognitive function and memory in neurological disorders

Submission Author: Leila Hosseini

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Background and Aim : -Neurocognitive dysfunction and memory impairment are common comorbidity for many neurological disorders and no effective treatment has yet been identified. Neuromodulation has gained attention as a potential non-pharmacological intervention for memory and cognition impairment. Transcranial direct current stimulation (tDCS) is a non-invasive technique of neuromodulation that has proven to influence performance in different cognitive domains. tDCS delivers low-intensity, direct current to cortical areas facilitating or inhibiting spontaneous neuronal activities. Effects of tDCS vary based on current polarity, intensity, time, and site of application.

Methods : -Here, we revised the effect of tDCS on the modulation of neuroplasticity and cognition in several brain diseases affecting memory and cognition. Studies included in this review were searched following the terms (“transcranial direct current stimulation”) AND (cognition OR memory) and according to the PRISMA statement requirements.

Results : -There are reports of improvement in different aspects of cognition after anodal stimulation, such as working memory, visuomotor coordination and naming in healthy subjects, recognition memory in Alzheimer’s disease, and working memory and mood in depression as well as working memory in schizophrenia-spectrum disorders. tDCS is a safe, easy, and noninvasive brain stimulation technique, therapeutically reliable, and with promising potential to promote cognitive enhancement and neuroplasticity. Since the use of tDCS has increased as a novel therapeutic approach in humans, preclinical studies are important to better understand its

mechanisms as well as to help improve the stimulation protocols and their potential role in different neuropathologies.

Conclusion : Our findings suggest that tDCS can be a potential therapeutic option to improve cognition and memory in brain disorders.

Keywords : tDCS; Cognition; Neuropsychology; Memory; Transcranial direct current stimulation

Count: 20
Abstract ID: 147
subject: Cognition: Learning and Memory
Presentation Type: Poster

A study of the effects of clove extract activated by plasma on the learning deficits and hippocampal superoxide dismutase activity in VPA-induced rat

Submission Author: Maryam FaghihNeiresy

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Background and Aim : In modern times, there exists a vast amount of evidence regarding the structural and functional changes that occur in the hippocampus, as well as the manifestation of autism spectrum disorder (ASD) phenotypes during childhood and development. Research studies have demonstrated that cloves possess a significant antioxidant capacity. Among the various bioactive compounds present in this plant, eugenol and phenolic compounds are found in the highest concentrations. These compounds exhibit remarkable protective properties against oxidative damage, thereby aiding in the prevention or delay of learning deficits. Over the past few years, plasma technology has gained significant attention as a new approach that is both environmentally friendly and highly efficient. This technology has captured interest across various industries and scientific fields due to its unique characteristics and potential applications. On the other hand, biomedical studies have revealed that cold atmospheric plasma is a promising technology for the development of drug properties, therapeutic compounds and providing an effective biological effect. Thus, this research aimed at studying the effect of aqueous clove extract (ACE) and aqueous clove extract activated by plasma (ACEP) on cognitive impairment induced by oxidative stress.

Methods : The bud's activation via dielectric barrier discharge (DBD) procedure by exposing to N2 gas for 10 mins was conducted after grounding buds and passing by the sieve. In this experimental study, pregnant Wistar rats were divided into two control and experimental groups. In the experimental group, valproic acid (VPA) was injected intraperitoneally at a dose of 500 mg/kg on day 12/5 of pregnancy. 21 days after birth, 7 male pups were placed in each group. The control and the VPA group received saline, VPA + ACE group received ACE and the VPA + ACEP group received ACEP both orally at a dose of 15 mg/kg for 3 weeks. Finally, 42 days after birth, a novel object recognition test (NORT) was performed to evaluate short-term and long-term memory. The activity of superoxide dismutase (SOD) as an endogenous antioxidant enzyme was assessed by Genet method.

Results : In the novel object recognition test, VPA injection significantly reduced the duration of interaction with the new object ($p < 0.0001$) in the VPA group compared to the control. In compartment with clove extract, the experimental group treated with ACEP was able to significantly ($p < 0.001$) increase the interaction time with the novel object by improving memory while ACE administration showed no notably changes. We observed decreased in SOD activity in VPA compared to control ($p < 0.05$). While ACE treatment showed no remarkably changes compared to control, ACEP administration could significantly enhance SOD activity in compartment with VPA group ($p < 0.001$).

Conclusion : The oral administration of clove which is rich in Eugenol can probably strengthen the learning process by improving oxidative damage involved in memory. Therefore, these results state that nitrogen-based CAP treatment is probably a positive and effective factor in developing bioactive herbal compounds by stimulating antioxidant features and enhancing memory improvements in the VPA rat model.

Keywords : ASD, Learning, Plasma, Antioxidant, clove

Count: 21
Abstract ID: 53
subject: Cognition: Learning and Memory
Presentation Type: Poster

Cross state-dependent memory retrieval between tramadol and ethanol: involvement of dorsal hippocampal GABAA receptors

Submission Author: Mohammad Sheibani

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Background and Aim : Tramadol and ethanol, as psychoactive agents, are often abused. Discovering the molecular pathways of drug-induced memory creation may contribute to prohibiting drug addiction and relapse. The tramadol and ethanol-induced state-dependent memory (SDM) and cross-SDM retrieval between tramadol and ethanol were examined in this study. Moreover, because of the confirmed involvement of GABAA receptors and GABAergic neurotransmission in memory retrieval impairment, we assessed cross-SDM retrieval between tramadol and ethanol with a specific emphasis on the role of the GABAA receptors. First hypothesis of this study was the presence of cross-SDM between tramadol and ethanol, and second hypothesis was related to possible role of GABAA receptors in memory retrieval impairment within the dorsal hippocampus.

Methods : The cannulae were inserted into the hippocampal CA1 area of NMRI mice, and a step-down inhibitory avoidance test was used to evaluate state dependence and memory recovery. The post-training and/or pre-test administration of tramadol (2.5 and 5 mg/kg, i.p) and/or ethanol (0.5 and 1 g/kg, i.p.) induced amnesia, which was restored after the administration of the drugs 24 h later during the pre-test period, proposing ethanol and tramadol SDM

Results : The pre-test injection of ethanol (0.25 and 0.5 g/kg, i.p.) with tramadol at an ineffective dose (1.25 mg/kg) enhanced tramadol SDM. Moreover, tramadol injection (1.25 and 2.5 mg/kg) with ethanol at the ineffective dose (0.25 g/kg) promoted ethanol SDM. Furthermore, the pre-test intra-CA1 injection of bicuculline (0.0625, 0.125, and 0.25 µg/mouse), a GABAA receptor antagonist, 5 min before the injection of tramadol (5 mg/kg) or ethanol (1 g/kg) inhibited tramadol- and ethanol-induced SDM dose-dependently.

Conclusion : In conclusion, the findings strongly confirmed cross-SDM between tramadol and ethanol and the critical role of dorsal hippocampal GABAA receptors in the cross-SDM between tramadol and ethanol.

Keywords : Tramadol; Ethanol; State-dependent memory; Bicuculline; Dorsal hippocampus; Mouse

Count: 22
Abstract ID: 84
subject: Cognition: Learning and Memory
Presentation Type: Poster

Varenicline, a nicotinic receptor agonist, improves the pathophysiology of Brain Ischemia-Induced Cognitive Impairment in mice with medial prefrontal cortex ischemia

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Background and Aim : Post-stroke disabilities like cognitive impairment impose omplex conditions with great economic burdens on health care systems. Medial prefrontal cortex (mPFC), which plays roles in memory, learning, executive function, planning, cognitive flexibility and attention is affected by ischemic stroke. Cerebral ischemia in the mPFC causes cognitive dysfunction including anxiety-like behaviors and memory impairment in stroke survivors. So far, no effective treatment has been identified for these impairments. Some of the pathologies such as inflammation, apoptosis and synaptic disruption are associated with cognitive impairment after ischemic stroke. Nicotinic acetylcholine receptors (nAChRs) are belongs to the family of ligand-gated ion channels and so far nine alpha (α210) and three beta (β24) isoforms of receptor subunits have been identified in neurons. nAChRs participate in various behavioral and neurobiological functions. nAChRs reduce neuroinflammation, oxidative stress, and apoptosis, as well as increase neurogenesis and synaptic plasticity also, improve cognitive functions in brain ischemic models. Numerous human and animal studies have shown the effects of varenicline as α7 and α4β2 nAChRs agonist in reducing neuroinflammation, increasing nerve regeneration, and improving cognitive functions in a variety of pathological conditions. The purpose of this study was to evaluate the dosedependent effects of varenicline as a nAChRs agonist and a neuroprotective agent on cognitive impairment, inflammation, apoptosis and synaptic dynamics in mPFC photothrombotic ischemia in male BALB/c mice.

Methods : 72 adult male BALB/c mice were divided into control, sham and photothrombotic ischemia groups in the mPFC region. The control and sham groups received normal saline for 14 days. Also, the ischemic groups received normal saline at dose of 2 mg/kg or varenicline with doses of 3 and 1, 0.1 mg/kg for 14 days. All groups received normal saline or varenicline orally by gavage. Anxiety-like behaviors of animals were investigated through the open field and elevated plus maze tests. Morris water maze and novel object recognition tests were used to investigate spatial and episodic memory in animals. The levels of inflammatory factors (IL-1β, TNF-α), apoptotic factors (Bax, caspase3, BCL-2) and synaptic proteins (SYP, PSD95, GAP-43) were measured by western blot method. BDNF neurotrophic factor levels were evaluated by ELISA method. H&E staining method was also used to evaluate tissue damage.

Results : According to our results, varenicline (3 mg/kg) decreased the levels of IL-1β, TNF-α, Bax and caspase 3 in mice with ischemia in the mPFC region. Also, it increased the levels of BCL-2, BDNF, SYP, PSD-95 and GAP-43 and improved memory impairment and anxiety-like behaviors.

Conclusion : The findings of this research showed that varenicline (3 mg/kg) probably has a protective role against cognitive impairm ents caused by mPFC ischemia through the reduction of inflammatory and apoptotic factors, as well as the improvement of synaptic dynamics and the increase of the neurotrophic factor.

Keywords : cerebral ischemia, varenicline, medial prefrontal cortex, memory, anxiety.

Count: 23
Abstract ID: 417
subject: Cognition: Learning and Memory
Presentation Type: Poster

Potential role of cinnamon in improving cognitive disorders: A systematic review

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Background and Aim : -Cinnamon is obtained from the brown bark of trees named Cinnamomum and is a commonly used spice and flavoring material for deserts, candies, chocolate, etc. It has a long history as a medicine as well. The most important constituents of cinnamon are cinnamaldehyde and trans-cinnamaldehyde, which are present in the essential oil. Cognitive disorders, also known as neurocognitive disorders (NCDs), are a category of mental health disorders that primarily affect cognitive abilities including learning, memory, perception, and problem-solving. This study aimed to systematically review studies about the relationship between cinnamon, its metabolite, and bioactive compounds in improving NCDs.

Methods : -Five hundred studies were collected from different databases (PubMed, Google Scholar, and Web of Science) without any time limitation in September 2023 and went under investigation for eligibility. As a result, after removing irrelevant and duplicated articles, 30 studies were included in this systematic review. Among the included studies, 23 articles were In vivo studies, two were In vitro, and five clinical studies were also accomplished.

Results : -The main outcome of most studies (n = 29) proved that cinnamon significantly improves cognitive function on memory and learning, prevents the toxicity of A? on neuronal PC12 cells, reduces the oxidative damage and gliosis, and increases spatial memory consolidation-induced activation of cAMP response element-binding protein (CREB) and expression of plasticity-related molecules in the hippocampus. In vivo studies showed that using cinnamon or its components, such as sodium benzoate (NaB) cinnamyl alcohol, eugenol, cinnamaldehyde, and cinnamic acid, could positively alter cognitive function. In vitro studies also showed that adding cinnamon or cinnamaldehyde to a cell medium can reduce tau aggregation, Amyloid ? and increase cell

viability. Clinical studies showed positive effects on cognitive function and most studies reported that cinnamon might be useful for preventing and reducing cognitive function impairment. It can be used as an adjuvant in the treatment of related diseases. Studies have shown that cinnamon and its bioactive compounds can influence brain function and affect behavioral characteristics and possess neuroprotective effects interfering with multiple oxidative stress and pro-inflammatory pathways. Cinnamon supplementation significantly reduced C-reactive protein (CRP) and malondialdehyde (MDA) levels, moderately reduced IL-6 levels, and increased total antioxidant capacity (TAC). Other studies have shown that cinnamon treatment reduces oxidative damage and gliosis in the hippocampus of Tg-5XFAD mice. Furthermore, the use of cinnamon inhibits lipopolysaccharides (LPS)-induced expression of inducible NO synthase (iNOS), proinflammatory cytokines (Tumor necrosis factor ? and IL-1?), and surface markers (CD11b, CD11c, and CD68) in mouse microglia.

Conclusion : According to different articles cinnamon and its bioactive compounds can improve cognitive disorder. However, further molecular studies and clinical trials are required to establish the therapeutic safety and efficacy in different cinnamon species.

Keywords : Cinnamon; Cognitive disorders; Cellular mechanism; Learning; Memory

Count: 24
Abstract ID: 132
subject: Cognition: Learning and Memory
Presentation Type: Poster

NEUROMODULATION OF MESENCHYMAL STEM CELL THROUGH PPAR SIGNALING IN ALZHEIMER'S DISEASE MODEL

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Background and Aim : Alzheimers disease (AD) is a brain disorder characterized by memory loss, cognitive impairment, and synaptic dysfunction that interferes with daily life. There are links between insulin signaling in the brain and neuromodulatory effects such as neuroendocrine and neurotrophic functions like synaptic plasticity. Therefore, both of type 2 diabetes mellitus (DM) and AD cause cognitive impairment, suggesting the therapeutic potential of antidiabetic drugs or pathways in treatment of AD. Peroxisome proliferator-activated receptor- (PPAR) regulated insulin sensitivity, cell differentiation , and therapeutic candidates for AD. Mesenchymal stem cells (MSCs) are multipotent stem cells that exhibit multilineage differentiation. MSCs have self-renewal and therapeutic functions in neuronal cells such as induce Amyloid beta (A) clearance, increase autophagy, activate microglia, induce neurogenesis.

Methods : In this study, 24 male Wistar rats weighing 220 20g with available food and water ad libitum condition were randomly divided into three groups including, Control, TMT+PBS (8 mg/kg TMT+ 0.5 ml PBS) and TMT+DPSCs (TMT + 1 106 cells/ml DPSC in 0.5 ml PBS) groups. After sacrificing the rats, brain tissue was removed. PPAR mRNA expression in brain tissue assessed through Real-time polymerase chain reaction (Real-time PCR). The data were analyzed using one-way ANOVA followed by Tukey analysis with SPSS software.

Results : The long shape fibroblastic morphology, plastic-adherent and adipogenic differentiation confirmed MSCs characterizations. Transplantation of MSCs significantly decreased the mRNA expression of PPAR compared to TMT+PBS group (P 0.0001).

Conclusion : PPAR are directly involved in AD pathophysiology and A metabolism. Transplantation of MSCs is promising new therapy for tissue regeneration and neurological disorders. MSCs ameliorates cognitive impairment and dementia in AD.

Keywords : Stem Cells, differentiation, neuromodulation, PPAR , Alzheimer's Disease

Count: 25
Abstract ID: 253
subject: Cognition: Learning and Memory
Presentation Type: Poster

Exploring the benefits of angiotensin-converting enzyme inhibitor captopril on brain-derived neurotrophic factor, nitric oxide metabolites, oxidative stress indicators, and interleukin-6 in the brain

Submission Author: Pourya Roknabadi

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Background and Aim : The role of renin angiotensin system (RAS) in the brain function including learning and memory have been suggested. In the present study the effects of the angiotensin converting enzyme inhibitor captopril, on brain-derived neurotrophic factor(BDNF, nitric oxide(NO) metabolites, oxidative stress indicators, and interleukin-6(IL-6) in the brain in a rat model of learning and memory impairment induced by scopolamine was investigated.

Methods : The rats were divided into five groups including (1) Control in which saline was administered instead of scopolamine and captopril, (2) Scopolamine group in which saline was administered instead of captopril and scopolamine was applied 30 min before the behavioral test, (3-5) Scopolamine + Captopril groups in which 10, 50 and 100 mg/ kg of captopril were applied over two weeks before the experiment and was also continued to be injected 30 min before scopolamine. Morris water maze (MWM) and passive avoidance (PA) tests were conducted. The brains were then removed and malondialdehyde (MDA), thiols, super oxide dismutase (SOD), catalase (CAT), IL-6, and nitric oxide (NO) metabolites were measured.

Results : In MWM test, scopolamine increased delay and the distance traveled to find the platform while, it decreased time spent and distance traveled in the target quadrant. In PA test, scopolamine

decreased the latency to enter the dark. Moreover, scopolamine enhanced, NO metabolites,IL-6, and MDA in the brain while, it decreased thiol, SOD, CAT, and BDNF. Although the latency and the traveled distance to reach platform were decreased by captopril, it enhanced the time spent and the distance traveled in the target quadrant. In PA test, captopril increased the latency to enter the dark. Furthermore, captopril improved thiol, SOD, CAT, and BDNF but attenuated NO metabolites, IL-6, and MDA.

Conclusion : Angiotensin-converting enzyme inhibitor captopril improved learning and memory impairment induced by scopolamine. Improvement of BDNF and protection against oxidative stress, neuroinflammation, and NO can be regarded as a possible mechanism(s).

Keywords : Captopril, Memory, Scopolamine, Brain-derived neurotrophic factor, Interleukin-6, Nitric oxide

Count: 26
Abstract ID: 131
subject: Cognition: Learning and Memory
Presentation Type: Poster

Therapeutic Effects of CORM3 and NaHS in Chronic Kidney Disease induced Cognitive Impairment in Rat

Submission Author: Zeinab Hamidizad

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Background and Aim : Cognitive impairment is a frequent and anticipated complication of chronic kidney disease (CKD) that causes social and communication problem. Neuroinflammation is one of the most important causes of cognitive impairment induced by CKD. Excessive accumulation of uremic toxins may cause overexpression of reactive oxygen species (ROS) and proinflammatory cytokines in the hippocampus that leads to impaired working memory confirmation, synaptic plasticity and long-term potentiation that ultimately, impairs cognitive function and induces dementia. Nowadays, many studies have shown that gas transmitters play essential roles in cell signaling pathways in many organs of body. Although, they were initially considered as toxic gases. Carbon monoxide (CO) and hydrogen sulfide (H2S) have many similar biological features. In the central nervous system (CNS), the CO/HO and H2S/CBS pathway plays an essential role in modulation of neuroinflammatory responses, antioxidant signaling pathways, cell survival and metabolism. Gas transmitters interact with one another for transducing signals and modulating cell function. The H2S/CBS and CO/HO-1 pathways have interactions and they may inhibit or potentiate each other. The protective effect of H2S and NaHS (H2S donor) in many pathological conditions is dependent on endogenous CO levels but the protective effect of CO and CORMs (carbon monoxide-releasing molecules) seemed to be H2S-independent.

Methods : Male Wistar rats, weighing 200–250 g, were used in the current study. The rats were subjected to either 5/6 nephrectomy or sham operations as previously described. Eight weeks after

sham or 5/6 nephrectomy (5/6Nx) operation, rats were located in a stereotaxic apparatus. Stainless-steel guide cannulas (a 23-gauge needle) was placed directly in to the right lateral ventricles. The stereotaxic coordinates were selected for intra-cerebro-ventricular (i.c.v) injection. Sixty rats were divided into six experimental groups: sham, five-sixth (5/6) nephrectomy (CKD), CKD+H2S donor (NaHS), CKD+CO-releasing molecule (CORM3), CKD+NaHS and zinc protoporphyrin IX (Znpp), CKD+CORM3 and amino-oxy acetic acid (AOAA). Eleven weeks after 5/6Nx, behavioral tests (Novel object recognition test, Passive avoidance test and Barnes maze test) were performed to evaluate the cognitive level. At the end of the twelfth week, blood urea nitrogen (BUN) and serum creatinine (sCr) levels were evaluated.

Results : CKD caused enhancement of BUN and sCr and led to cognitive disturbances and memory and learning impairment. CORM3 and NaHS returned all above indices to the levels measured in the sham group. However, improving effects of CORM3 on cognitive impairment were prevented by AOAA and decreased H2S level as well as reciprocally improving effects of NaHS on cognitive disturbances were prevented by Znpp and decreased CO level.

Conclusion : Our data suggest that the improving effects of CORM3 and NaHS on memory and learning deficits in CKD rats are reciprocally interdependent. Many of the biological functions of H2S are mediated by CO, and the findings of this study suggested that the biological effects of CO on memory and learning are reciprocally mediated by H2S in CKD rats. However, investigations on the interactions between H2S and CO need to be further conducted.

Keywords : Cognitive impairment; Carbon monoxide; Hydrogen sulfide; Chronic kidney disease

Count: 27
Abstract ID: 143
subject: Cognition: Learning and Memory
Presentation Type: Poster

Melatonin protective effect against amyloid β-induced neurotoxicity mediated by mitochondrial biogenesis; involvement of hippocampal Sirtuin- 1 signaling pathway

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Background and Aim : Melatonin has a potential therapeutic value in Alzheimer's disease (AD), a disease that is associated with a dramatic decline in memory and cognitive abilities. The aggregation of the amyloid β (Aβ) peptide, a hallmark of AD, deactivates mitochondrial biogenesis and antioxidant defenses. Melatonin as an endogenous antioxidant, decreases in plasma and cerebrospinal fluid of AD patients. Even though several experimental studies have demonstrated the melatonin neuroprotection in AD, clinical trials of melatonin therapy have not yet confirmed outstanding results in AD patients. Better understanding of the molecular mechanisms involved in melatonin neuroprotective effects may pave the way for an efficient therapy. Hence, we investigated the involvement of silent information regulator 1 (SIRT1) signaling and mitochondrial biogenesis in melatonin neuroprotection in a rat model of cognitive impairment induced by intra-hippocampal Aβ injection.

Methods : Animals assigned to melatonin treatment in the presence or absence of SIRT1 inhibitor (EX527), for 14 consecutive days. Spatial working memory and anxiety level were examined with Y-maze and elevated plus maze tests respectively. Hippocampal SIRT1, transcription factor-A mitochondrial (TFAM) and mitochondrial DNA (mtDNA) copy number were measured.

Results : We observed a decrease in hippocampal SIRT1, which accompanied with reduction in TFAM and mtDNA copy number in the Aβ-injected rats. Melatonin treatment increased hippocampal SIRT1 and TFAM expression and enhanced mtDNA copy number in the

hippocampus. It also improved memory, ameliorated the anxiety, and attenuated hippocampal cell damage in the Aβ-injected animals.

Conclusion : These effects were blocked by EX527 administration, suggesting SIRT1 signaling involvement in melatonin neuroprotective effect. This mechanism may introduce a new promising strategy in battle against AD.

Keywords : Alzheimer's disease, Melatonin, Sirtuin-1, Mitochondrial biogenesis

Count: 28
Abstract ID: 201
subject: Cognition: Learning and Memory
Presentation Type: Poster

Oxytocin in dorsal hippocampus facilitates auditory fear memory extinction in rats

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Background and Aim : Fear extinction is impaired in some psychiatric disorders. Any treatment that facilitates the extinction of fear is a way to advance the treatment of related psychiatric disorders. Recent studies have highlighted the role of oxytocin (OT) in fear extinction, but the endogenous release of OT during fear extinction in the dorsal hippocampal (dHPC) is not clear. We investigated the release of OT during fear extinction and the role of the HPC - medial prefrontal cortex (mPFC) circuit and BDNF in the effects of exogenous OT on auditory fear conditioning in male rats.

Methods : endogenous release of OT measured by the microdialysis method. For behavioral experiments and revealing the effect of OT on fear extinction, auditory fear conditioning apparatus were used. ELISA-kit were used to examine BDNF concentration after fear extinction in HPC, IL and PL. Single-unit recording was used to estimate neural firing change in IL, PL and vHPC.

Results : We found that the release of endogenous OT in the dHPC is significantly increased during the fear extinction and recall test. Increased freezing response in the OT-treated rats compared to saline-treated rats showed that exogenous OT in the dHPC enhanced the fear extinction. Injection of BDNF antagonist (ANA-12) into the infralimbic (IL) blocked the effect of exogenous OT on the dHPC. Following injection, BDNF levels increased in the dHPC, ventral HPC, and IL cortex; but decreased in the prelimbic cortex (PL). Finally, OT microinjected into the dHPC significantly increased neural activity of pyramidal neurons of the CA1-vHPC and IL but decreased the neural activity in the PL cortex.

Conclusion : Our findings strongly support that the dHPC endogenous OT plays a crucial role in enhancing fear extinction. It seems that the activation of the HPC-mPFC pathway, and consequently, the release of BDNF in the IL cortex mediates the enhancing effects of OT on fear extinction.

Keywords : Oxytocin; Auditory fear conditioning; hippocampus; prefrontal cortex; Infralimbic; Brain-derived Neurotrophic Factor

Count: 29
Abstract ID: 316
subject: Cognition: Learning and Memory
Presentation Type: Poster

Eslicarbazepine prevents memory impairment in rats with glioblastoma

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Background and Aim : : Glioblastoma multiforme (GBM) is one of the most malignant and invasive types of brain tumors in adults. The main GBM treatments are surgery, radiotherapy, and chemotherapy. However, most patients become resistant to treatment and the tumor recurs after sometimes. GBM patients suffer from cognitive impairments. In addition, cognitive disorders are the side effects of radiotherapy and chemotherapy. Therefore, finding new drugs for the treatment of both tumor and its cognitive impairment is valuable. Eslicarbazepine acetate (ESL), which has an anti-tumor effect, is used for the treatment of mood disorders. Therefore, in this study, we examined the effects of ESL on memory impairment in rats with glioblastoma tumor.

Methods : In this study, eighteen male Wistar rats were used in three groups: a) GBM+vehicle group in which animal models of GBM received the vehicle, b) GBM+ESL group in which animal models of GBM received 30 mg/kg ESL, and the sham group. The effect of chronic (20 days) administration of ESL and vehicle on recognition, working memory impairment, and motor activity caused by glioblastoma tumor was investigated in a navel object recognition, Y maze, and open field tests in different groups.

Results : The results of the present study showed that glioblastoma caused a decrease in the spontaneous alternation index in rats after tumor induction in the GBM+vehicle group in the Y maze test (P<0. 01). Also, glioblastoma caused a decrease in the recognition Index in the novel object recognition test (P<0. 01). While, in the GBM+ESL group, there was no significant change

in these indexes compared to before tumor induction. In addition, no significant changes were observed in the movement indices of the animals after treatments.

Conclusion : ESL prevents memory impairment caused by glioblastoma tumor also it is probably due to changes in the brain circuits that cause improved memory.

Keywords : Glioblastoma, Eslicarbazepine acetate, Memory impairment, Y maze, Novel object recognition

Count: 30
Abstract ID: 252
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effects of sericin on sleep deprivation-induced cognitive dysfunction in mice: The role of oxidative stress and neuroinflammation

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Background and Aim : The duration and quality of sleep worldwide have been negatively impacted by various factors, causing neurologic and psychiatric disorders. Evidence suggests that sleep is crucial for learning and memory, and impaired sleep or sleep deprivation (SD) can negatively impact memory processing. Inflammatory responses and oxidative stress caused by SD have been linked to decreased learning and memory abilities. As a result, it is quite obvious that protective compounds should be used when the patient is deprived of adequate sleep. Sericin (Ser), a protein naturally produced by silk worms, has been found to have anti-inflammatory and antioxidant properties, offering neuroprotection. This study aimed to investigate the potential impact of different Ser doses on cognitive impairment induced by SD.

Methods : In this study, we used fifty young-adult male C57BL/6 mice (8 weeks old) weighing 25-30g. The mice were divided into wide platform (WP) or SD groups. The animals in the SD group was subdivided into 4 groups, including normal saline (NS), Ser 100, Ser 200, and Ser 300 groups. To induce the SD model, animals were subjected to a modified multiple platform and sleep-deprived for 72 h, while control animals were placed on the WP. The animals were given NS or Ser (100, 200, and 300 mg/kg) through oral gavage for 8 consecutive days, commencing 5 days prior to SD and continuing throughout the SD period. To measure the influence of Ser on spatial learning and memory, the Lashley III maze experiment was performed. Furthermore, we evaluated serum corticosterone levels and oxidative stress markers in the hippocampus, such as malondialdehyde (MDA), total antioxidant capacity (TAC), and the activity of superoxide dismutase (SOD) and glutathione peroxidase (GPx) enzymes. Furthermore, the western blot method was used to investigate the expression levels of growth-associated protein-43 (GAP-43),

post-synaptic density 95 (PSD95), synapsin-1 (SYN-1), synaptophysin (SYP), and markers of inflammation.

Results : Our findings revealed that SD led to cognitive impairment; however, pretreatment with Ser effectively prevented this detrimental effect. Additionally, serum corticosterone levels were found to increase in SD, but this effect was counteracted in SD mice receiving Ser. Moreover, the reduction in SOD and GPx activity caused by SD was reversed by Ser administration and concurrently boosted TAC levels and lowered MDA levels in the hippocampus. Ser pretreatment also induced an increase in synaptic proteins, including GAP-43, SYP, SYN-1, and PSD-95 and suppressed protein expressions of IL1-? and TNF-?, as markers of inflammation, in the hippocampus.

Conclusion : In conclusion, our study demonstrated that sericin (Ser) has remarkable neuroprotective properties and effectively alleviated SD-induced cognitive impairment. This was achieved through the suppression of oxidative stress damage, up-regulation of synaptic proteins, and reduction of inflammation in the hippocampus.

Keywords : Sleep deprivation, Sericin ,Neuroinflammation ,Oxidative stress ,Synaptic dysfunction ,Memory impairment

Count: 31
Abstract ID: 262
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effects of high-intensity interval training on oxidative stress indices in the hippocampus following tramadol consumption in male rats

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Background and Aim : Studies have shown that exercise improves memory and tramadol consumption impairs memory, but so far, no study has been conducted on the effect of high-intensity interval training on memory following tramadol consumption. Since oxidative stress can cause memory impairment, the present study aimed to investigate the effect of 8 weeks of high-intensity interval training on hippocampal oxidative stress following tramadol consumption in male rats.

Methods : Male rats were divided into 4 groups: SAL (salin,1ml/day), TM (50 mg/kg/d), EX (exercise) and TM +EX (tramadol and exercise). SAL, TM and TM +EX groups were injected at a dose of 50 mg/kg intraperitoneal (i.p.) 5 days a week in the first month and 3 days a week in the second month. EX and TM +EX groups do high-intensity interval training 5 days a week for 60 days. The hippocampus was isolated 48 hours after the last training session and the GPX, MDA, TAC and NO factors were measured in it

Results : The TM group showed a significant increase in MDA level (P< 0.001) compared to SAL levels, whereas a significant decrease in MDA level (P< 0.01) was shown in the EX group compared to the SAL. In addition, the TM+EX group showed a significant decrease in MDA levels compared to TM levels (P< 0.001). TM group revealed a significant increase in NO level (P< 0.001) compared to SAL levels. A significant decrease in NO level (P< 0.05) was revealed in the EX group compared to the SAL group. In addition, EX decreased NO level (P< 0.001) in the TM+EX group compared to TM levels. One-way ANOVA revealed no significant difference in GPx activity among groups.

Conclusion : Based on our findings, we conclude that High intensity interval exercise following the consumption of tramadol was able to reduce the levels of oxidants and increase the levels of antioxidants and was effective in improving oxidative stress in the hippocampus, followed by memory and learning.

Keywords : Tramadol, High-intensity interval training, Memory, Stress oxidative

Count: 32
Abstract ID: 260
subject: Cognition: Learning and Memory
Presentation Type: Poster

Folic acid supplementation improved nicotine withdrawal-induced of memory loss via affecting oxidative status, inflammatory response, cholinergic activity, BDNF and amyloid-B in adolescent male rat

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Background and Aim : Background: The present study aimed to assess whether folic acid (FA) have potential to prevent memory impairment caused by nicotine (Nico) withdrawal in adolescent male rats.

Methods : Methods and materials: The experiments were divided into 7 groups: 1) vehicle, 2) Nico (Nico 2 mg/kg injection from 21-42 days of ages), 3-5) Nico FA5/10/15mg/kg (received Nico from 21-42 days of ages and received FA at three doses 5, 10 and 15mg/kg 43-63 days of ages), and 6) received normal saline from 21-42 days of age after that received FA 15mg/kg by oral gavage from 43-63 days of age. At 64-69 days of ages, behavioral tests related to memory including Morris Water Maze (MWM) and Object Recognition Test (ORT) were performed and related biochemical analysis including the hippocampal levels of oxidative stress markers, inflammatory indices, brain-derived neurotrophic factor (BDNF), nitrite, amyloid-B and acetylcholinesterase [1] were measured.

Results : Results: Results showed that nicotine exposure in adolescence followed by withdrawal dramatically impaired learning and memory performance along with affecting a variety of biochemical markers in the hippocampal tissues. In addition, it was observed that administration of FA significantly ameliorated Nico withdrawal-induced adverse effects through restoration of the mentioned biochemical disturbances.

Conclusion : Conclusion: The present study and other relevant researches demonstrated that FA as a well-known, inexpensive, and safe supplement has strong potential to either prevent or ameliorate the detrimental effect of Nico withdrawal. However, further investigation is required to be more elucidated the precise mechanisms underlying memory impairment-induced by Nico withdrawal.

Keywords : Nicotine; Learning and memory impairment; Folic acid; Withdrawal

Count: 33
Abstract ID: 313
subject: Cognition: Learning and Memory
Presentation Type: Poster

Gut Microbiota and Cognitive Function: A Systematic Review

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Background: In recent years, the scientific community has observed a notable increase in interest surrounding the gut-brain axis, with a particular emphasis on the microbiota, a critical component of this complex interaction. The gut microbiota, a dynamic microbial community, is gaining recognition for its ability to influence not only neural function but also behavior and cognitive processes. Objective: The central goal of this comprehensive review is to systematically assess the current body of literature exploring the profound impact of gut microbiota on cognitive function. Cognitive function encompasses a wide array of processes, including memory, attention, and decision-making, which are pivotal for our daily lives. Emerging research points to a remarkable connection between these cognitive processes and factors beyond the confines of the brain. Methods: To accomplish this objective, we undertook an extensive and rigorous search across existing research, meticulously synthesizing studies that delve into the intricate relationship between gut microbiota and cognitive function. Our systematic review sheds light on this emerging field by offering compelling insights into the multifaceted interplay between the gut microbiota and cognitive function. Results: The findings from our systematic review significantly advance our understanding of the pivotal role played by gut microbiota in shaping cognitive function. This intricate interplay is becoming increasingly apparent and holds promising implications for cognitive outcomes and overall well-being. Of particular note, our review underscores the potential for probiotics to exert a positive influence on cognitive performance, offering exciting prospects for interventions geared toward enhancing cognitive health.

Keywords : gut microbiota; cognitive function; gut-brain axis; microbial composition; probiotic

Count: 34
Abstract ID: 314
subject: Cognition: Learning and Memory
Presentation Type: Oral

The effect of high-intensity interval training and coenzyme Q10 supplementation on passive avoidance memory and synaptic plasticity in a rat model of amyloid beta-induced Alzheimer's disease

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Background and Aim : Alzheimer's disease (AD) as the commonest cause of dementia, poses a great socioeconomic burden on the community. We investigated the comparative effects of pretreatment with coenzyme Q10 (CoQ10) and high-intensity interval training (HIIT) alone and in combination for eight continuous weeks, on the cognitive deficit, hippocampal synaptic plasticity, and amyloid-beta (Aβ) plaque formation in an AD rat model induced by an intracerebroventricular (ICV) microinjection of Aβ1-40.
Methods : Eighty male Wistar rats were randomly assigned to the sham, control, Q10 (50 mg/kg; P.O.), HIIT (high intensity: 4 min running at 85-90% VO2max, low intensity: 3 min running at 50-60% VO2max), Q10 + HIIT, AD, vehicle, AD + Q10, AD + HIIT, and AD + Q10 + HIIT groups.
Results : There was a decrease in memory capacity associated with a decrease in both components of LTP (population spike amplitude and field excitatory postsynaptic potentials slope) and an increase in A? plaque production in the A?-induced rats. Interestingly, pretreatment with CoQ10, HIIT, or both could markedly ameliorate hippocampal LTP impairment, improve passive avoidance memory dysfunction, and hinder A? plaque accumulation in the hippocampus in A?-induced rats.
Conclusion : It can be stated that pretreatment with CoQ10, HIIT, or both improved Aβ-related behavioral deficits, probably through the alleviation of hippocampal synaptic dysfunction and inhibition of Aβ plaque generation.
Keywords : Alzheimer's disease; Coenzyme Q10; High-intensity interval trainings; Long-term potentiation; Passive avoidance memory; Rat

Count: 35
Abstract ID: 442
subject: Cognition: Learning and Memory
Presentation Type: Poster

The hippocampal expression of miR33 in impaired inhibitory avoidance memory following bile duct ligation in rats

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Background and Aim : Hepatic encephalopathy (HE) induced by bile duct (BDL) ligation causes the accumulation of endogenous opioids in the nervous system resulting in memory impairment. The role of microRNA33 (miR33), has been established in memory impairment induced by opioids. The aim of the present study was to investigate whether there is a change in miRNA-33 expression following impaired memory by the induction of HE in rats.

Methods : fifty rats were divided into 5 groups: control, sham, BDL, BDL+ naloxone (BDLN). The BDL was surgically induced by the ligation of bile ducts. Then, the inhibitory avoidance memory and miR-33 expression were evaluated 14 days after surgery.

Results : Rats in the BDL group revealed a shorter latency (sec.) compared to control ($P<0.05$). However, the naloxone (2mg/kg/ip) restored the impaired memory induced by BDL ($P<0.001$). Moreover, the relative expression of miR-33 was increased and decreased in BDL and BDLN groups, respectively ($P<0.001$).

Conclusion : Given the alteration of miR-33 expression in BDL, it could be proposed as a biomarker for memory impairments induced by HE and other hepatic disorders.

Keywords : hepatic encephalopathy; miR33; avoidance memory; opioids; rats

Count: 36
Abstract ID: 445
subject: Cognition: Learning and Memory
Presentation Type: Oral

Bile duct ligation alters the long-term potentiation and avoidance memory via the opioid pathway in rats

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Background and Aim : Hepatic encephalopathy (HE) induced by bile duct ligation (BDL) causes the accumulation of endogenous opioids in the nervous system resulting in memory impairment. The long-term potentiation (LTP) is an established model for long-term memory. The aim of the present study was to investigate the alteration of long-term potentiation and inhibitory avoidance (IA) memory following the induction of HE in rats.

Methods : A total of forty rats were divided into four groups: control, sham BDL (bile duct ligation), and BDL+ Naloxone. The LTP and IA memory were performed twenty-one days after the surgery by measuring the field excitatory post-synaptic potentials (fEPSP%) and latency time (sec), (respectively).

Results : The IA latency and fEPSP% were decreased in the BDL group both in the IA memory and electrophysiology tests, as compared to control or sham rats ($p<001$). However, Naloxone (2 mg/kg) restored both the latency and fEPSP% in IA and electrophysiological tests, respectively ($p<0.01$ and $p<0.001$).

Conclusion : The finding that naloxone can reverse the impairing effects induced by HE on IA memory and hippocampal field potentials signifies the possible involvement of the opioid mechanism in the event.

Keywords : hepatic encephalopathy; plasticity; avoidance memory; opioids; rats

Count: 37
Abstract ID: 409
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effects of zinc supplementation and treadmill exercise during pregnancy on prenatal stress-induced learning and memory deficits, neurogenesis biomarkers and cell apoptosis in adult male rats

Submission Author: Sina Fatehfar

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Background and Aim : Stressful prenatal circumstances have a significant impact on fetus development and may lead to a variety of neurological disorders later in life. One of the most significant of these alterations would be the negative consequences on central nervous system morphology and function which can eventually disrupt memory and learning skills. Physical or pharmacological interventions may be used to prevent or reduce the neurological deficits caused by prenatal stress (PS). Our study investigated the effects of prenatal physical activity and zinc supplementation on PS-induced memory and learning deficits in adult male rat offspring at postnatal day (PND) 90.

Methods : Pregnant rats were divided into 5 groups: control, stress, stress + exercise, stress + zinc, and stress + exercise + zinc. The stress groups were exposed to restrain stress for 5 consecutive days (G15-19). Rats in the exercise and zinc groups were subjected to either forced treadmill exercise (30 min/daily), zinc sulfate (30 mg/kg/orally), or both throughout the pregnancy and

similarly exposed to the stress. At PND 90, the Morris water maze (MWM) test was used to assess memory and learning status in male offspring. Each of the rats was trained in the maze for 4 consecutive days and was then put to the test on the fifth day. The gene expression levels of brain-derived neurotrophic factor (BDNF) and glial fibrillary acidic protein (GFAP) were also measured in the hippocampus.

Results : The time spent to find the plate was used to evaluate learning and the time spent in the target area was used to evaluate memory. The results showed that both the exercise and zinc groups took less time to find the plate and spent more time in the target area compared to the stress group. BDNF levels showed an increase in the zinc supplementation group indicating its beneficial effect on PS-induced cognitive impairments in the offspring and the same was seen with the exercise group. A synergistic effect was seen for BDNF levels due to a meaningful increase in the exercise+zinc supplementation group. Similarly, GFAP level was increased in a meaningful manner in both the zinc supplementation and exercise groups indicating their protective effects on neural glial cells. Both exercise and zinc supplementation groups showed a decreased level of Caspase expression which could indicate lower levels of cell apoptosis, though these changes were not meaningful

Conclusion : Prenatal zinc supplementation and involuntary exercise improved PS-induced memory and learning deficits through modifications of BDNF and GFAP levels. These findings suggest the clinical importance of zinc and physical activity against PS-induced cognitive impairment.

Keywords : Prenatal stress; Zinc; Physical exercise; BDNF; GFAP

Count: 38
Abstract ID: 334
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effect of vitamin D on MDA and NO levels of alcohol-dependent rats

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Background and Aim : Despite half a century of research on vitamin D (Vit-D), its association with ethanol (Eth) abuse and dependence has only been discussed in recent decades. Evidence also suggests the involvement of Vit-D in the development of dopaminergic neurons in the nucleus accumbens, an increase in the expression of tyrosine hydroxylase, and the regulation of dopaminergic processes. The novel idea for this work is taken from a hypothesis given about the effectiveness of Vit. D on dopamine signaling pathway. It is therefore presumed that Vit. D can be considered an effective therapeutic approach for narcotic addiction and substance abuse.

Methods : Rat (n = 42) were divided into six equal groups control, vehicle, Ethanol [Eth.], and Vit. D [250, 500, and 1000 IU/kg, i.p.]). Malondialdehyde (MDA) levels were measured to determine lipid peroxidation (LPO) in the brain tissue in terms of nmol/mg protein. The nitric oxide (NO) levels were determined in the brain tissue in nmol/mg protein by measuring the supernatant metabolites using Griess. One-way analysis of variance (ANOVA) and post hoc Tukey test were used for statistical analysis.

Results : A significant increase was observed in MDA and NO levels in the brain tissue in the Eth. and Veh. groups compared to Ctl. ($F_{5, 24} = 14.88$, $p < .0001$). A significant decrease in MDA and NO levels in the brain tissue was also observed in the Vit-D250($p<.05$), Vit-D500($p<.001$), and Vit-D1000 ($p < .01$) groups compared to Eth. Moreover, the post hoc Tukey's test also showed a

significant decrease in MDA and NO levels in the brain tissue in the Vit-D250 ($p<.05$), Vit-D500($p<.001$), andVit-D1000($p<.01$) groups compared to Veh.

Conclusion : The biochemical findings of this study suggest the beneficial effects of Vit. D on antioxidative/oxidative profiles. In the present study, brain concentrations of MDA and NO were higher in the Eth. group compared to Ctl. One can assume that increased MDA and NO suggest the inability of Eth. to protect the brain from OS. Nevertheless, all the administered doses of Vit. D (especially 500 IU) decreased MDA and NO levels significantly. In line with the present findings, these results further sup- port the antioxidant effect of Vit. D and potential tissue protection in lipid oxidation and inflammation damages.

Keywords : Vitamin D, Ethanol, Condition place preference , Rat , Malondialdehyde , Nitric oxide

Count: 39
Abstract ID: 346
subject: Cognition: Learning and Memory
Presentation Type: Poster

Zataria multiflora extract reverses lipopolysaccharide-induced neuroprotective and memory disorder in rats

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Background and Aim : The study was aimed to evaluate the effects of hydro-ethanol extract Zataria multiflora on the brain tissue oxidative damage, and hippocampal interleukin-6 (IL-6) as well as learning and memory capacity in lipopolysaccharide (LPS) - challenged rats.

Methods : The rats were randomized into five groups as follow: Control group: Rats were treated with saline, LPS group: Rats were treated with LPS 1.00 mg kg-1, ZM50, ZM100 and ZM200 groups in which the rats were treated with Z. multiflora extract (50.00, 100 or 200 mg kg-1 per day, respectively). The treatments including extract or vehicle were administered intraperitoneally dna given three days before the behavioral tests and were continued within a6-day behavioral experiment. Injection of LPS was daily done before the behavioral tests. Finally, the brains were collected for biochemical evaluations

Results : Although LPS administration prolonged the latency in Morris water maze and shortened the latency to enter the dark chamber in passive avoidance test, ZM extract restored these changes

to approach control group values. Also, LPS increased IL-6, malondialdehyde (MDA) and nitric oxide (NO) metabolites levels and lowered thiol, superoxide dismutase (SOD) and catalase (CAT) levels in the brain, however, Z. multiflora extract reduced IL-6, MDA and NO metabolites concentrations, but increased thiol content, SOD, and CAT levels.

Conclusion : The results of this study showed that Z. multiflora ameliorated learning and memory dysfunction in LPS - challenged rats by alleviating of inflammatory responses and brain tissue oxidative damage

Keywords : Inflammation, Lipopolysaccharide, Memory, Oxidative stress, Zataria multiflora

Count: 40
Abstract ID: 352
subject: Cognition: Learning and Memory
Presentation Type: Poster

Anti-apoptotic and neurogenic properties in the hippocampus as possible mechanisms for learning and memory improving impacts of vitamin D in hypothyroid rats during the growth period

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Background and Aim : Evidence declared that Vitamin D (VD) acts not only as a maintaining and regulating mineral metabolism but also as a neuroprotective agent. In light of this, the current study tested the protective effects of VD on hippocampal neurogenesis, apoptosis, and subsequent hippocampal-dependent learning and memory performance in hypothyroid juvenile rats.

Methods : The animals were randomly divided into four groups; control, Hypothyroid (Hypo), Hypo-VD100, and Hypo-VD500. Hypothyroidism was induced in rats by giving 0.05% propylthiouracil (PTU) in drinking water for six weeks, and VD (100 or 500 IU/kg) treatment was performed daily by gavage. At the end of treatment, a Morris water maze (MWM) was carried out to appraise learning and memory performance. Then, immunohistochemistry, TUNEL assay, and toluidine blue staining were used to evaluate hippocampal neurogenesis, apoptosis, and dark neurons (DNs), respectively.

Results : Our results revealed that the escape latency and the traveled distance to find the platform in the Hypo group were significantly longer but the time spent and distance traveled in the target area in the probe trial were lower than in the control group ($p<0.001$). Moreover, hypothyroidism was accompanied by a marked alleviation in hippocampal neurogenesis by decreasing

neurogenesis markers (DCX and SOX2) in the subgranular zone (SGZ) of the dentate gyrus (DG), and a significant increase in the number of apoptotic neurons as well as increased DNs compared to the control group ($p<0.001$). However, treatment by VD decreased escape latency and the traveled distance to find the platform but increased the time spent and distance traveled in the target area in the probe trial than the Hypo group ($p<0.001$). Treatment with VD also increased neurogenesis, reduced apoptotic neurons, and DNs production compared to the Hypo group ($p<0.05$, $p<0.01$).

Conclusion : In conclusion, these results support a role for VD in restoring hippocampal neurogenesis impairment, reducing neuronal apoptosis, and DNs in hypothyroid rats as well as raise the possibility that VD may contribute as a therapeutic approach to improve the learning and memory deficits associated with hypothyroidism.

Keywords : Vitamin D, Hypothyroidism, Hippocampus, Neurogenesis, Apoptosis, Learning and Memory

Count: 41
Abstract ID: 381
subject: Cognition: Learning and Memory
Presentation Type: Poster

Feeding metformin during pregnancy and lactation periods improved learning and memory impairment in the rat offspring exposed to febrile seizure: Role of oxidative stress and inflammatory response

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Background and Aim : Many clinical evidences have reported the higher risk of seizure in young children and infants after exposure to hyperthermia which more likely can cause brain damage and affect cognitive function, so, many researches were focused on prevention or treatment of febrile seizure (FS) with minimal adverse effects. Considering the potential effects of oxidative stress as a prominent trigger in febrile seizure, and demonstrating the antioxidant effects of metformin, the present study aimed to investigate the protective effect of metformin administration in prenatal and lactation periods in rat pups exposed to hyperthermia by which induced seizure.

Methods : Pregnant rats were divided into 6 groups: 1- vehicle: pregnant rats received normal saline during pregnancy and lactation, 2-FS: pregnant rats received normal saline during pregnancy and lactation, 3-5) FS-Met50/100/150mg/kg: pregnant rats received different doses of metformin including 50, 100, and 150 mg/kg during pregnancy and lactation, 6) Met150mg/kg: pregnant rats received Met 150mg/kg during pregnancy and lactation. The male pups born to mothers received in all FS groups exposed to hyperthermia. All experimental groups were allowed to grow up and after the lactation period, they were subjected for behavioral tests and biochemical analysis.

Results : According to the present findings, the prenatal and lactation exposure to the highest dose of metformin demonstrated significant difference with FS group in both behavioral and biochemical test analysis. Although the remaining doses of metformin were also effective, the much better results were reported with the highest dose of metformin (150 mg/kg). Interestingly, the highest dose of metformin administered alone demonstrated better result than vehicle in probe trial test.

Conclusion : Considering the present research and related study in relation to metformin in ameliorating the epilepsy symptoms, there are numerous evidences on positive effect of metformin

on seizure. Although the exact mechanism is unclear, the antioxidant effect of metformin is strongly supported.

Keywords : febrile seizure; metformin; breastfeeding; prenatal exposure

Count: 42
Abstract ID: 394
subject: Cognition: Learning and Memory
Presentation Type: Poster

Exosomes enhance adult hippocampal neurogenesis through microRNAs signaling pathway

Submission Author: Farzaneh Fazli

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Exosomes enhance adult hippocampal neurogenesis through microRNAs signaling pathway Farzaneh Fazli1, Mohammad Karimi pour1, Sattar Sadeghi Bavil2 1) Department of Anatomical Sciences, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz 2) Sina hospital, Tabriz University of Medical Sciences, Tabriz The procedure of generating new granule cells and functional interneurons postnatally by the neural stem and progenitor cells (NSPCs) is called Adult neurogenesis. This procedure occurs in two main region of brain, including: the subgranular zone (SGZ) of the hippocampal dentate gyrus (DG) and the subventricular zone (SVZ) of the lateral ventricles(1). In SGZ, neural stem cells proliferate and differentiate in to the adult neuron then the new born neuron migrate the short distance of the granule cell layer (GCL) of the DG, in order to integrate into the local hippocampal circuits as excitatory granule cells(2). Adult neurogenesis is an intrinsic physiological process that each step of this procedure (from the proliferation of NSPCs to the maturation and survival of newborn neurons) is regulated by multiple signaling factors(3). The signaling factors (such as morphogens, neurotransmitters, growth factors and transcriptional factors) that release from nearby or distant cells interact with cell membrane receptors of NSPCs, then these signaling factors along with signaling molecules in the cytoplasm and intra-nucleus of NSPCs effect on adult neurogenesis(4, 5). the signaling factors carry by exosomes. Exosomes are nano-sized EVs with variable genetics, proteomics, and lipidomics and can be found in different biofluids, making them valuable bioshuttles in regenerative medicine (6-9) for instance, some biomolecules that demonstrate can regulate the adult neurogenesis such as VEGF (vascular endothelial growth factor)(123), BDNF (brain-derived neurotrophic factor)(10), Notch1(11), miR-124(12), miR-9 (13) and let-7b (14) have detected in various exosomes. Stem cells are one of the major producer of exosomes that deliver exosome cargos such as protein and RNA in to the specialized neurogenic niches in DG and by this pathway can transfer of their biological function and stemness characteristic to the adult NSPCs, thus Stem cell-derived exosomes have an essential role in the maintenance, proliferation and neuronal differentiation of adult NSPCs in hippocampus which are associated with the normal functioning of the hippocampus(15). Also some exosomes with positive regulator cargos lead to the normal adult neurogenesis in the hippocampus but some of them with negative regulator cargos cause to the abnormal adult neurogenesis in the

hippocampus, for example based on invitro experiments, scientists find that exosomal miR139-5p, has negative effect on healthy adult neurogenesis and lead to the depression (16). Researchers find that upregulation of expression of miRNA-26a in hBM-MSCs-derived exosome lead to alleviate damage and apoptosis of hippocampal neurons in depressive rats, also MSCs-derived exosomes improved the behavioral function of depressive rats and increase the proliferation of hippocampal NSPCs through upregulation of expression of miRNA-26a(17). On the other hand, scientists indicated that when healthy mice receive the blood exosomes extracted from patients with depressive disorder via tail intravenous injection, hippocampal neurogenesis suppressed in these mice (18,19). Therefore, using of exosome depend on their cargos, for example researchers use of some exosomes as a biomarker in order to recognize special mental disorders on the other hand they can utilize exosomes as a treatment through promoting adult hippocampal neurogenesis.

Keywords : Exosome; Hippocampus; neurogenesis

Count: 43
Abstract ID: 554
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Effects of Intranasal Insulin Administration During Pregnancy on Cognitive Performance of Adolescent Male Offspring

Submission Author: MAHDIYEH ABBASPOOR

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Background and Aim : Evidence suggests that activation of immune system during pregnancy leads to disruptions of fetal brain development. The stimulation of maternal immune system, known as maternal immune activation (MIA), contributes to the pathophysiology of neuropsychiatric disorders in offspring. On the other hand, several studies have emphasized on beneficial effects of insulin on various aspects of cognitive performance. It has been demonstrated that intranasal insulin administration can facilitate insulin delivery to the cerebrospinal fluid without being absorbed into peripheral blood.
Methods : In the present work, on gestation day 15, Wistar pregnant rats received intraperitoneal injection of lipopolysaccharide (LPS), to induce MIA. Moreover, a group of pregnant rats received 1 IU intranasal insulin on gestation days 15-19, while the other group received intranasal saline. Then, during adolescence, cognitive performance of male offspring was investigated through behavioral tests, including the Morris water maze, open field test and marble burying test.
Results : Our results demonstrated a significant difference in behavioral performance, particularly in obsessive behavior, among adolescent male pups from MIA dams that received intranasal insulin during pregnancy compared to the pups of other dams.
Conclusion : These observations suggest that intranasal insulin administration can alleviate behavioral dysfunctions in offspring affected by maternal inflammation.
Keywords : Maternal Immune Activation, Inflammation, LPS, Cognition, Adolescence

Count: 44
Abstract ID: 416
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Protective Effect of Glycitin on Memory Impairment in Male Wistar Rats

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Background and Aim : Memory impairment is a prevalent cognitive disorder that affects individuals across various age groups. It may be caused by multiple factors, including epilepsy, many anti-epileptic medications, and different underlying brain abnormalities. Phytoestrogens, such as glycitin, have gained attention for their potential neuroprotective effects. This study aimed to investigate the effect of glycitin on memory impairment in male Wistar rats.

Methods : Male Wistar rats were randomly divided into six groups: vehicle control, memory impairment model, phenobarbital and glycitin-treated groups. Memory impairment was induced by administering pentylenetetrazole (PTZ) intraperitoneally. The saline-only was administered to the vehicle control group, whereas the memory impairment model group was given saline initially, followed by PTZ (35 mg/kg) after 30 minutes. The phenobarbital-treated group received phenobarbital (30 mg/kg), and the glycitin-treated groups received different doses of glycitin (5, 10, and 20 mg/kg) respectively, followed by PTZ after 30 minutes. All injections were given intraperitoneally once every 48 hours for a total of 21 days. Behavioral test was conducted to assess learning and memory performance using the Shuttle Box test.

Results : After successfully creating the kindling model of epilepsy in PTZ-treated animals, results showed that PTZ administration had a significant effect on learning and memory performance in the Shuttle Box test compared to the vehicle control group ($p < 0.001$). However, treatment with

glycitin significantly improved learning and memory performance compared to the memory impairment model group ($p < 0.001$).

Conclusion : These findings suggest that glycitin exerts a protective effect against memory impairment induced by PTZ in male Wistar rats. Further investigations are warranted to elucidate the underlying mechanisms of glycitin's neuroprotective effects and its potential as a therapeutic agent for memory impairment in humans.

Keywords : Memory impairment, Epilepsy, Phytoestrogens, Glycitin

Count: 45
Abstract ID: 439
subject: Cognition: Learning and Memory
Presentation Type: Poster

Evaluation of the possible effect of interaction between ghrelin and dopamine D1 receptor agonist SCH23390 on cognitive impairments in STZ-Alzheimer rat model

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Background and Aim : Alzheimer's disease is the most common type of dementia in the elderly and is characterized by progressive cognitive impairment and memory impairment. Ghrelin may be associated with the pathophysiology and potential treatment of Alzheimer's disease. Ghrelin increases dopamine signaling by binding to its receptor (GHS-R1a) and heterodimerizing the GHS-R1a receptor and the D1 receptor antagonist (SCH23390). In this study we investigated the possible effect of ghrelin and SCH23390 in interaction with D1 receptor in cognitive disorders in the Alzheimer's model caused by STZ injection.
Methods : In this study, male Wistar rats weighing 200 to 250 grams are used. Mice are randomly divided into 6 groups (n = 10). The studied groups are: 1- control group (saline + saline) 2- STZ + saline group 3- ghrelin + saline group 4- STZ + ghrelin group 5- STZ group + (SCH23390) 6- group STZ + (SCH23390) + ghrelin. Induction of pathological features of Alzheimer's in mice by icv injection of STZ on the first and third days. The ghrelin and D1 receptor antagonist groups also receive ghrelin as icv and D1 antagonist for two weeks daily after one week of recovery half an hour before ghrelin injection. Behavioral and electrophysiological tests are performed on animals after injecting drugs. In this study, two cognitive-behavioral tests MWM and passive avoidance test are used to measure changes in cognitive abilities. Mice are eventually anesthetized with urethane and field potential recordings are taken from the hippocampal DG.
Results : The results showed that developmental STZ exposure in adult rats caused impairments in LTP of DG and GHS-R1a increased the induction and maintenance of LTP, SCH23390 reduced these properties.
Conclusion : Results suggested that the interaction of ghrelin and SCH23390 increased cognitive impairment in the Alzheimer's model induced by STZ injection.
Keywords : Streptozotocin, Alzheimer's, Ghrelin, DRD1, SCH23390

Count: 46
Abstract ID: 494
subject: Cognition: Learning and Memory
Presentation Type: Poster

Vitamin B1 improved learning and memory and attenuated oxidative stress and acetylcholinesterase activity in the brain in a rat model of hypothyroidism

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Background and Aim : Hypothyroidism has been reported to induce oxidative stress in the brain which if followed by learning and memory dysfunction. Vitamin B1 has been considered to have some beneficial effects including neuroprotection and antioxidant properties. This study was done to investigate learning and memory improving effects of vitamin B1 and its attenuating effects on oxidative stress and acetylcholinesterase activity in the brain in a rat model of hypothyroidism.

Methods : Juvenile male rats (21 days old) were used in the present study and they were randomly divided into 5 groups: (1) Control group which orally received saline instead of vitamin B1, (2) Hypothyroid group in which propylthiouracil (0.05% in drinking water) was given during 6 weeks. (3-5) Three groups in which besides PTU, 50, 100, and 200 mg/kg of vitamin B1 was orally given during 6 weeks. Morris water maze (MWM) and passive avoidance (PA) tests were done and the rats were then sacrificed, the brains were removed, and oxidative stress indicators (malondialdehyde (MDA) and thiol concentration and superoxide dismutase (SOD) activity) and AchE activity were measured.

Results : Hypothyroidism impaired performance of the rats in both MWM and PA tests. The rats of hypothyroid group had longer traveling time and distance to find the platform and spent shorter time and traveled shorter distance in the target area than the control group in MWM test. The rats of hypothyroid group also showed a shorter delay to enter the dark part and spent shorter time in the light part in PA test and they spent longer time in the dark part. A decrease in SOD activity and thiol content and an increase in MDA and AchE activity was seen in the brain tissue of hypothyroid group compared to the control group. In vitamin B1 treated groups especially at 100 and 200 mg/kg doses, a decrease in the traveling time and distance to reach the platform was seen in MWM test. In MWM test, vitamin B 1 also increased the time spent and the traveling distance in target area($P < 0.05$ to $P < 0.001$). In PA test, vitamin B 1 increased latency to enter the dark and total time spent in the light but decreased the time spent in the dark and number of entries into the dark($P < 0.05$ to $P < 0.001$). The biochemical data showed that vitamin B 1 decreased MDA concentration and AchE activity but increased SOD activity in the brain.

Conclusion : Our results showed that that Vitamin B1 improved learning and memory and attenuated oxidative stress and acetylcholinesterase activity in a rat model of hypothyroidism.

Keywords : Cholinergic disturbance, Acetylcholinesterase, Hypothyroidism, Learning, Memory, Oxidative stress.

Count: 47
Abstract ID: 506
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Effects of Early Maternal Deprivation on Cognitive Function and Morphology of Hippocampal CA3 Pyramidal Neurons in Adult Rats

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Background and Aim : Environmental conditions in the early stages of life, especially exposure to stress during the brainstorming period, have profound and lasting effects on how the individual responds to stress in adolescence and adulthood, and can affect the vulnerability or resilience to stress-induced behavioral responses, including cognitive functions. The hippocampus is involved in responding to stress and also plays an important role in cognitive and emotional processes. The hippocampus is the main regulator of the hypothalamic-pituitary-adrenal axis, as well as a structure with high vulnerability to early life experiences. It performs important roles in memory, especially spatial memory and declarative memory. In this work, the effects of early maternal deprivation on spatial memory, passive avoidance memory and morphology of CA3 neurons was investigated.

Methods : Newborn male and female Wistar rats were divided into two groups; control and treatment. Pups were separated from mother for 3 hours each day from PND1 to 21. On PND67 to PND93, the spatial memory of rats was evaluated in radial arm maze. Also on PND 98 and 99, passive avoidance test was performed. On PND 100, animals were sacrificed by transcardial perfusion and the morphology of CA3 pyramidal neurons was studied by analyzing Golgi-Cox technique.

Results : The results of spatial memory test showed that the amount of reference memory error in MD female rats compared to control female rats was decreased and in MD male rats compared to control male rats was increase. Also the number of working memory error in MD female rats compared to control female rats was reduced and in the control group, it was higher in female rats compared to male rats. Analysis of data from passive avoidance test showed that passive avoidance memory is improved in maternally-deprived (MD) rats compared to control animals. The morphological study demonstrated a significant decrease in the complexity of basal dendritic of

CA3 neurons in MD male rats compared to control male rats. On the other hand, in female rats a significant increase in the complexity of basal and apical dendritic was observed in MD rats compared to control animals.

Conclusion : These findings suggest that the impact of maternal deprivation on the dendritic morphology of CA3 neurons is sex-dependent and may contribute to stress-induced memory impairment in male rats.

Keywords : CA3 Pyramidal Neurons, Maternal Deprivation, Morphology, Passive Avoidance Memory, Radial Arm Maze, Spatial Memory

Count: 48
Abstract ID: 515
subject: Cognition: Learning and Memory
Presentation Type: Poster

Probiotic supplementation restores spatial learning and memory deficits induced by prenatal stress

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Background and Aim : Prenatal stress impairs spatial learning and memory of the offspring. Various animal studies reported the role of probiotics on cognitive behavior. Effects of probiotics treatment in early postnatal periods on learning and memory deficits induced by prenatal stress are unknown.
Methods : Study was carried out on the male Wistar rats. Offspring were divided into four groups: Control rats (CO), and prenatal stressed rats (PS) were orally received 1 ml normal saline, or 1 ml probiotics mixture contained Bifidobacterium longum, Lactobacillus acidophilus, Bifidobacterium bifidum, and Lactobacillus fermentum (103 CFU of each) daily. Pregnant rats throughout pregnancy were subjected to a regimen of chronic unpredictable stressors (CUS). After weaning at postnatal day 22, experimental offspring were orally received 1 ml normal saline, or 1 ml probiotics mixture for one month. Spatial learning was evaluated by the Morris water maze (MWM) at 3 consecutive days (4 trials/day). The rats' spatial memory retrieval was also estimated on the last day.
Results : Our results indicated that rats whose mothers received CUS during pregnancy period spent more time and traveled more distance to find the hidden platform than the controls in the learning stage. Also, they spent less time and passed less distance in the target quadrant, in probe trial. However, spatial learning and memory deficits induced by prenatal CUS were recovered by probiotics treatment.
Conclusion : We concluded that probiotics can be successfully employed for recovery spatial learning and memory impairment induced by prenatal CUS in rats.
Keywords : Prenatal chronic unpredictable stressors, Probiotic, Spatial learning and memory, Rats

Count: 49
Abstract ID: 522
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effects of endurance exercise and metformin on memory impairment caused by diabetes

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Background and Aim : Objectives: Diabetes has a negative effect on learning and memory performance, and it is a risk factor for Alzheimer's disease and dementia development. The present study aims to investigate the effects of two kinds of endurance exercise including high-intensity interval training (HIIT) and moderate-intensity continuous training (MICT) as well as metformin on impaired memory and learning related to streptozotocin (STZ) induced diabetes in rats.

Methods : Methods: Forty adult male rats (250 ± 20 g weight) were divided into five groups (n=8), including control, diabetic, as well as diabetic rats treated with metformin (300 mg/kg), and HIIT (20 m/min), and MICT (15 m/min) exercises. Diabetes was induced by STZ (60 mg/kg, i.p.). Serum glucose concentration and oxidative stress markers (SOD, CAT, thiol, and MDA) in the cortex and hippocampus were determined by colorimetric assay. Behavioral tests were performed with a passive avoidance test.

Results : Results: The diabetic groups treated with metformin and both HIIT, and MICT exercises improved the latency and the staying time in the darkroom and lightroom. The entrance frequency into the darkroom also was restored ($p<0.01$–$p<0.001$). In both HIIT and MICT exercises as well as metformin groups the oxidative stress induced by diabetes has been reversed and attenuation of the serum glucose level has been observed compared to non-treated diabetic ones ($p<0.05$–$p<0.001$).

Conclusion : Conclusions: The results of the present study revealed both HIIT and MICT exercises had protective effects against oxidative stress and behavioral impairments induced by diabetes and these effects were comparable to the effects of metformin.

Keywords : diabetes; exercise; memory impairment; metformin.

Count: 50
Abstract ID: 589
subject: Cognition: Learning and Memory
Presentation Type: Poster

Investigating the Pyramidal Neurons' Spontaneous Activity CA1 Region of Dorsal Hippocampus after Vitamin D Injection in Adult Male Rats Model of Alzheimer's Disease

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Background and Aim : Previous studies' results show the effect of vitamin D on central nervous system disorders. Accordingly, the present study aims to evaluate the effect of intraperitoneal injection of this vitamin on the spontaneous activity of pyramidal neurons in the CA1 region of the dorsal hippocampus in adult male rats after inducing Alzheimer's disease model by electrical lesion of Nucleus Basalis Magnocellularis (NBM).

Methods : In this study, 48 adult male rats were divided into 4 groups (n=12). Intact+sesame oil (Vehicle), NBM lesion+sesame oil, sham+sesame oil, and NBM lesion+vitamin D (10 µgr/kg). All rats (one week after surgery in rats that underwent surgery) underwent tracheostomy after deep anesthesia with urethane. The rats were placed in the stereotaxic device immediately after tracheostomy. The single unit recording of neurons was performed for 120 minutes (15 minutes of baseline recording + 105 minutes after the injection of sesame oil or Vitamin D) by placing the electrode in the pyramidal neurons' layer of the CA1 region of the dorsal hippocampus.

Results : The results showed a significant difference in the average frequency of pyramidal neurons in the CA1 region of the dorsal hippocampus between the NBM Lesion+Sesame Oil and Intact+Sesame Oil groups ($P < 0.001$). However, the average frequency of these neurons did not show a significant change in the Sham+Sesame Oil and Intact+Sesame Oil groups ($P>0.05$). Moreover, a significant difference was observed in the mean frequency of these neurons in the NBM Lesion+Sesame Oil and NBM Lesion+Vitamin D groups ($P < 0.05$).

Conclusion : Acute intraperitoneal injection of vitamin D increases the spontaneous activity of pyramidal neurons in the CA1 region of the dorsal hippocampus in adult male rats model of alzheimer's disease with the electrical lesion of NBM.

Keywords : Vitamin D, Nucleus Basalis Magnocellularis, Hippocampal neurons, single-unit recording

Count: 51
Abstract ID: 631
subject: Cognition: Learning and Memory
Presentation Type: Poster

Evaluation of effects of an aqueous extract of Alcea rosea L. flowers on Passive avoidance and spatial working memory tests in the aged rats

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Background and Aim : Benzodiazepines (BZDs), such as lorazepam, midazolam, diazepam and clonazepam, are established first-line drugs for the acute treatment of seizures. BZDs are a family of drugs that exert their effects by allosterically modulating the activity of the ionotropic gamma-aminobutyric acid (GABA)-A receptor in the central nervous system (CNS). These drugs increase the probability that GABA binding to the receptor will open the associated Cl− channel. Thus, these drugs generally decrease neuronal excitation and exhibit antiseizure, sedative-hypnotic, anxiolytic, and muscle relaxant properties. However, clinical use of anxiolytic agent BZDs is limited by their side effects such as respiratory depression, motor coordination deficits, dependence liability and memory/cognitive dysfunctions. Therefore, finding novel therapeutic agents with fewer complications such as memory/cognitive dysfunctions in the treatment with BZDs is of major interest to researchers. Before, we showed that an aqueous extract of Alcea aucheri (Alcea genus in the malvaceae family) had has antiseizure, sedative and anxiolytic effects in animal models. So far, no study has been done on the effect on learning and memory on plants of the genus Alcea. The present study was conducted to investigate possible effects a short term treatment with an aqueous extract of Alcea rosea, the common hollyhock (another species from the genus Alcea) on learning and memory in the aged rats.

Methods : Male Wistar rats weighing 270-320 g (8-9 months old; Pasteur institute, Tehran, Iran) were used in this study. Using the natural exploratory behavior of mice, the spontaneous alternation in Y-maze was used to assess short-term spatial working memory. The step-through latency (STL) was used to study long term memory, a cutoff point of 600s was considered. Rats

were treated with Saline or aqueous extract of A. rosea at doses of 35, 175 and 700 mg/kg were administered intraperitoneally for 4-days before behavioral study. One day later, Y-maze test was performed; and 3 days later the protocol of passive avoidance test was started and performed. Therefore, training and retention test were performed at six and seven days, respectively, after the last injection. A p value of less than 0.05 was considered as significant.

Results : Statistical analysis showed no significant differences in spontaneous alteration between extract and control group, in Y-maze test. Meanwhile, in extract-treated rats, the arm entries were significantly decreased compared with saline group. Moreover, in passive avoidance test no significant differences in STL was found between extract and control group.

Conclusion : Our findings showed that flower extract of A. rosea probably had no adverse effect on memory parameters in passive avoidance or Y-maze test. But, the extract reduced locomotor activity in the Y-maze test. The later finding possibly may be suggestive of a sedative effect for A. rosea in the aged rats.

Keywords : Learning and memory, Passive avoidance test, Y-maze test

Count: 52
Abstract ID: 550
subject: Cognition: Working Memory
Presentation Type: Oral

Electrical stimulation of olfactory bulb mitigates Alzheimer's-related memory decline and pathology in a rat model

Submission Author: Payam Shahsavar

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Background and Aim : Electrical stimulation of deep brain structures has exhibited promise in alleviating Alzheimer's disease (AD). It may achieve this by bettering cognitive function and decreasing disease-linked anomalies. However, the invasive nature of this technique presents obstacles to clinical and research utilization. The olfactory bulb (OB), displaying early AD-associated alterations and widespread neural connections to memory areas, furnishes an appealing access point for intervention. Stimulating the OB could potentially reinstate normal activity in degenerating memory circuits in AD.

Methods : Our examination explored the effects of electrical stimulation applied to the OB on working memory, alongside exploring pathological and electrophysiological changes in the OB, medial prefrontal cortex, hippocampus, and entorhinal cortex using a rat model of amyloid beta-induced AD.

Results : Stimulation of the OB thwarted the buildup of A? plaques and prevented working memory deficits in AD model rats. Moreover, it elicited heightened power spectral density across various frequency bands and improved coherency, especially in the gamma band, within the examined brain regions during a working memory task.

Conclusion : This study underscores the capacity of brain stimulation based on the olfactory pathway to regulate the functioning of profound memory networks for the treatment of AD. Crucially, the accessibility of this pathway through the nasal cavity establishes a foundation for devising minimally invasive strategies aimed at modulating the olfactory pathway in the brain.

Keywords : Electrical stimulation; Deep brain stimulation; Working memory; Olfactory pathway

Count: 53
Abstract ID: 423
subject: Cognition: Working Memory
Presentation Type: Poster

The Effects of Open and Closed Skill Sports on Attention and Memory Performance in Girl Young Adults

Submission Author: Razieh Khanmohammadi

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Background and Aim : There is no convincing evidence for a complex relationship between cognitive development and motor development. In this regard, it has been shown that parts of the brain such as the prefrontal cortex and the cerebellum overlap with each other in motor and cognitive control. Schmidt & Weisberg 2008 stated that sports can be classified into two types: open-skill (e.g., racquet sports, team sports) and closed-skill (e.g., running, swimming, cycling), depending on the variety. , predictability and complexity of the execution environment According to the broad transfer hypothesis, extensive) practice of specific skills can improve cognition for situations outside the specific sports context. A study showed that children who regularly participate in an open-skill sports activity (soccer) had better cognitive performance than a non-sports control group and children who participate in a closed-skill sports activity (track and field). No significant difference was observed between athletes with closed skills and the sedentary control group. Considering the suggested in previous research, we examined the effect of different types of sport (basketball, track, and field) on executive functions based on recognizing the relationship between cognitive functions

Methods : semi-experimental research with a pre-test and post-test design was implemented on 3 groups which were matched for age and sex: open-skill group (OS; n = 20, mean age = 20 ± 1.2 years), closed-skill group (CS; n = 20, mean age 21.1 ± 2.3 years), and control group (n = 20, mean age = 20.7 ± 1.1 years). The whole research lasted 15 weeks. Pre-test information was collected in the first two weeks. Students participated in open and closed sports training for 10 weeks, twice a week and each session lasted 60 minutes. In the last 3 weeks, the variables in the post-test were measured. Data of the Pre-test and post-test resulting from the test of 10-meter gait speed under dual-task conditions were analyzed by Univar ate analysis of covariance. Data from

the Pre-test and post-test resulting from the tests of N-back and Wisconsin card sorting were analyzed by multiple analyses of covariance

Results : the scores of students in both groups (OS and CS) in attention and working memory were increased significantly compared to their pre-test scores. There was a significant difference between the three groups in the post-test scores of working memory and attention. Attention and working memory were better in the open-skill group than in the closed-skill and control group

Conclusion : In OS sports, participants must adapt their responses to external stimuli in a dynamic environment in order to perform well, but in the CS group with a relatively stable environment, perform repetitive and predetermined patterns . Cognitive demands in basketball complex movement may help to better explain the effects of open-to-close skills on attention in the present study. In agreement with studies background, taking part in OS and CS sports increases cognitive performance. The present study extends existing knowledge to support the hypothesis that OS fields tend to impose higher cognitive demands due to visual cognitive skills compared to close

Keywords : attention, closed-skill sport, open-skill sport, working memory

Count: 54
Abstract ID: 496
subject: Cognition: Working Memory
Presentation Type: Oral

Electrical stimulation of olfactory epithelium prevents mechanical ventilation-induced memory impairment and hippocampal apoptosis and synaptic imbalance

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Background and Aim : Mechanical ventilation (MV) as a live-saving intervention is association with some cognitive dysfunctions such as memory impairment. Absence of nasal respiration during mechanical ventilation leads to impairment of respiration-entrained brain rhythms. According to functional connectivity between olfactory bulb and limbic system, we have evaluated the impact of olfactory bulb stimulation on memory, inflammation, apoptosis and electrophysiological alterations in the brains of mechanically ventilated rats.
Methods : Rats were allocated into four distinct study groups. Control group, Anesthesia group, Mechanical ventilation group, olfactory epithelium electrical stimulation group, (1Hz, 250µA, 6h). Local field potentials were recorded from olfactory bulb, medial prefrontal cortex and hippocampus during 6 hours anesthesia. 24 hours later, we have examined memory performance, inflammation, apoptotic factors and also electrophysiological characteristics of CA1 pyramidal neurons by patch clamp recording technique.
Results : Our results revealed that mechanical ventilation not only diminishes memory performance but also disrupts neural circuit activities associated with memory, amplifies inflammation and apoptotic factors in the hippocampus, and upsets the equilibrium of excitatory-inhibitory currents in CA1 pyramidal neurons. Intriguingly, electrical stimulation of the olfactory epithelium prevented the occurrence of disturbances following mechanical ventilation.
Conclusion : The application of olfactory epithelium electrical stimulation can be consider as a noninvasive and protective method to prevent memory impairment and pathological changes induced by mechanical ventilation in hospitalized patients.
Keywords : (mechanical ventilation; olfactory epithelium stimulation; memory; patch clamp recording)

Count: 55
Abstract ID: 308
subject: Cognition: Working Memory
Presentation Type: Poster

Exploring Personal Preferences in Visual Working Memory

Submission Author: Shirin Mazhabjafari

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Background and Aim : Visual working memory (VWM) plays a crucial role in storing and recalling visual information, including features like color, shape, and location. However, it is not impervious to errors and distortions, which can impact cognitive processes. These errors often manifest as systematic deviations from accurate recall, influenced by factors such as the number of items held in memory and neural noise. One notable type of error, known as "swap errors," involves mistaken reports of non-target features; and can be influenced by statistical regularities during object encoding. Furthermore, the influence of different colors, including individuals' favorite colors, on working memory remains uncertain, despite the recognized significance of color in cognitive functions. Exploring how preferred colors affect behavior and memory accuracy is essential for understanding the relationship between preferences and cognitive processes, with potential applications in psychology, design, and marketing. This study aims to explore memory biases towards favorite stimuli, particularly favorite colors, and their impact on memory errors, shedding light on this intriguing aspect of human cognition

Methods : We conducted an experiment with 36 university students, assessing their color memory accuracy under various conditions. Participants engaged in a color-matching task to gauge the fidelity of color perception. Subsequently, they selected their favorite color for a set of objects. This favorite color was then integrated into a working memory task, where participants remembered the color of one, three, or five squares, with the target color varying in distance, The crucial factor regarding distance was how the target color in the memory task differed in terms of its position on the color wheel (color space) from their favorite color. Error measurement was conducted through a probabilistic mixture model, assessing responses' deviation from the true color and their relation to the favorite color. These measures were subject to statistical analyses.

Results : The analyses revealed a systematic memory bias towards the favorite color. Across all color-distance segments, memory errors were clustered around the favorite color, suggesting swap errors. Moreover, memory errors were more prevalent when the color distance from the favorite color was longer.

Conclusion : This study provides insights into the influence of favorite colors on memory recall, demonstrating the occurrence of swap and guessing errors in working memory due to implicit statistical regularities related to participants' favorite colors. The findings align with existing models of attraction and repulsion bias in memory, with repulsion away from the favorite color for shorter distances and attraction towards the favorite color for longer distances. Our results enrich the understanding of memory processes and highlight the potential effects of environmental patterns on memory recall.

Keywords : Visual Working Memory (VWM); Swap Errors; Favorite Color; Attraction and Repulsion Bias; Color-Distance

Count: 56
Abstract ID: 115
subject: Cognition: Working Memory
Presentation Type: Poster

Assessing Rodent Working Memory: A Review of Tasks and Methodological Approaches

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Background and Aim : Working memory, a cornerstone of higher-order cognitive functions, is vital for tasks that require transient information storage and manipulation. While much is known about human working memory, understanding its dynamics in rodents can elucidate the neural underpinnings and foster translational applications. This review consolidates our current understanding of various tasks and experimental setups designed to assess rodent working memory.

Methods : We embarked on a systematic review of both classical and emerging paradigms used in the assessment of rodent working memory. These included but were not limited to the radial arm maze, T-maze, Y-maze, and novel object recognition tasks. Each task's methodology, key variables, and neural circuits were critically examined, considering the latest advancements and literature.

Results : The radial arm maze and T-maze remain staples in assessing spatial working memory, each with unique advantages and challenges. Y-maze, with its spontaneous alternation approach, offers a more innate measure of working memory without necessitating prior training. The novel object recognition task, capitalizing on rodents' inherent exploratory behaviors, gauges non-spatial aspects of working memory. Beyond these tasks, innovative paradigms are emerging, emphasizing flexibility and adaptability in memory demands. A clear thread across studies is the interplay of various brain regions, especially the prefrontal cortex, hippocampus, and associated neural circuits, in modulating working memory functions.

Conclusion : Assessing working memory in rodents offers profound insights into the neural basis of cognitive operations, which can be crucial for understanding human cognitive health and potential interventions. By offering a consolidated view of traditional and novel paradigms, this review bridges current knowledge gaps and aids researchers in selecting and designing appropriate experimental protocols. The multifaceted nature of working memory demands the continual evolution of our assessment tools, ensuring the capture of its true essence across species.

Keywords : Rodent working memory; Cognitive assessment; Experimental setups; Task design; Translational neuroscience.

Count: 57
Abstract ID: 397
subject: Cognition: Working Memory
Presentation Type: Poster

Aging decreases the precision of visual working memory

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Background and Aim : As individuals age, cognitive abilities such as working memory (WM), decline. In the current study, we investigated the effect of age on WM, and elucidated sources of errors

Methods : A total of 102 healthy individuals, aged 18 to 71, participated in this research. We designed and administered a face-based visual WM task, collecting responses via a graded scale in a delayed match-to-sample reproduction task.

Results : The error of participants increased significantly as they aged. Our analysis revealed a significant age-related rise in the standard deviation of error distribution. However, there was no significant change in uniform probability with age.

Conclusion : We found that WM performance declines through the lifespan. Investigating the sources of error, we found that the precision of WM decreased monotonously with age. The results also indicated that the probability of guessing the response as a measure of random response is not affected by age.

Keywords : Aging; working memory; face; working memory task; continuous error

Count: 58
Abstract ID: 62
subject: Cognition: Working Memory
Presentation Type: Poster

Effect of berry-based supplements and foods on cognitive function: a systematic review

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Background and Aim : In the current decade, a growing body of evidence has proposed the correlation between diet and cognitive function or dementia in the aging population. This study was designed to appraise discoveries from randomized controlled trials to confirm the effects of berry-based supplements or foods on cognitive function in older adults.

Methods : -PubMed/MEDLINE, Cochrane Central Register of Controlled Trials, Web of Science, Scopus, EMBASE, Google Scholar, and ProQuest as well as SID, Magiran, and Iranmedex electronic databases were explored for human interventional studies up to March 2021. In total, eleven articles were identified using frozen blueberry (n = 4 studies), blueberry concentrate (n = 2), beverage (n = 3), capsule (n = 1), extract, and powder (n = 1). These studies had been performed among older people with no recognized cognitive impairment or mild cognitive impairment (MCI).

Results : - The primary outcomes included global cognitive function, psychomotor function, learning and memory, working memory capacity, executive functions, and brain perfusion/activity. To our knowledge, this is the first systematic review of available clinical trials on the effects of berry-based supplements and foods on cognitive performances as well as brain perfusion parameters among the elderly with normal cognition or MCI.

Conclusion : Existing evidence concludes that berry-based supplements and foods have beneficial effects on resting brain perfusion, cognitive function, memory performance, executive functioning, processing speed, and attention indices.

Keywords : berry; cognition; attention; memory; adult; old subjects

Count: 59
Abstract ID: 512
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Relationship between cultural and executive function in Iranian-Afghan children

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Background and Aim : The acculturation complexity model provides a theoretical framework that links the level of engagement with two cultures to the development of cognitive skills. According to this model, biculturals who equally prefer both cultures often experience cultural conflicts and feel the need to resolve them. Through repeated attempts to reconcile these conflicts, they gradually develop integrative complexity, which is the cognitive ability to acknowledge, accept, and integrate competing perspectives on the same issue. Also, individuals who strongly favor one culture over the other are less likely to engage in such complex cognitive processes. Furthermore, research suggests that the cognitive advantage of biculturals who endorse both cultures with equal strength extends beyond culture-specific tasks. This study focuses on Iranian-Afghan children who come from immigrant backgrounds. By examining the consequences of their immersion into two distinct cultures, the researchers aim to investigate how biculturalism influences executive functioning. According to the acculturation complexity model, the immersion into conflicting and dissonant cultures is most likely to promote cognitive skills.

Methods : The study involved 40 children of Afghan descent living in Tehran, aged 8-14 years (Male). To assess executive functioning, a Dot Task was administered using images of hearts and flowers, following the methodology outlined by Diamond et al. (2007). The task consisted of three different conditions designed to measure working memory, inhibitory control, and cognitive flexibility. In each trial, a red heart or flower would appear on either the right or left side of the screen for 750 milliseconds. In the first block, known as the congruent condition. In the second block, known as the incongruent condition. In the third block, known as the mixed condition.

Results : The study found that the children predominantly identified more strongly with their Afghan cultural background compared to Iranian culture. In the Dot Task, the children performed

with high accuracy in the congruent trials (mean = 95.11%, SD = 2.77%, range 66-88%), followed by the incongruent trials (mean = 94.52%, SD = 7.81%, range 77-97%), and had the lowest accuracy in the mixed trials (mean = 77.61%, SD = 11.69%, range 45-94%) (p-values ≤ 0.001). To investigate the link between the children's cultural identities and their executive functioning, three separate moderation analyses were conducted. These analyses explored the moderating effects of Afghan identity, Iranian identity, and the interaction between Iranian and Afghan identities on executive functioning.

Conclusion : Our findings suggest that biculturals who frequently switch between cultural frames can apply this skill to enhance their switching abilities in tasks unrelated to culture. Interestingly, even children who reported a relatively low identification with both their Iranian and Afghan identities performed well in the tasks. This aligns with similar findings reported by Tadmor et al. (2009) in their study on cognitive complexity among Asian American college students and Israelis in the United States. They argued that it is the equal preference for two cultures, rather than high levels of identification, that leads to internal conflicts caused by conflicting cultural values and cognitions. By repeatedly resolving these conflicts, biculturals can enhance their cognitive abilities.

Keywords : Cultural - Executive function - Biculturalism

Count: 60
Abstract ID: 21
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The Influence of Bilingualism on Executive Functions: A Review

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Background and Aim : Executive functions (EFs) refer to cognitive mechanisms used to control and coordinate other cognitive abilities. Core EFs include inhibition, attention, cognitive flexibility, and working memory. EFs in relation to bilingualism have been the subject of many studies since 1990. So the influence of bilingualism on EFs and its probable advantages for bilinguals have become important questions to answer. Studies in the last two decades on differences between monolinguals and bilinguals regarding EFs have shown different results. Therefore, this study aims to review the influence of bilingualism on executive functions.

Methods : The current study was conducted by searching databases such as Google Scholar, PubMed, ScienceDirect, and Scopus and using the keywords “bilingualism”, “executive function”, “cognition”, and “working memory”. The inclusion criteria were English articles between 2008-2023 and finally 25 relevant articles were found.

Results : According to some studies, bilingualism positively affects some executive functions. These effects are often observed on tasks assessing selective attention, inhibition, and cognitive flexibility because both languages are active when one is being used. Three studies have shown an advantage for bilinguals in working memory. However, recent results have indicated little cognitive differences between bilinguals and monolinguals in a way that these effects are indistinguishable from zero.

Conclusion : The studies reported different results because looking for bilingual advantages in executive functions might be problematic. In recent studies, bilinguals did not show significant advantages over monolinguals except in selective attention and inhibition tasks. The type of tasks, age group, sample size, cultural and linguistic background influence, and SES should be considered in future studies.

Keywords : Bilingualism; Executive functions; Cognition; Working memory

Count: 61
Abstract ID: 125
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Investigating the correlation between neural activity of the frontal cortex and response inhibition via QEEG

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Background and Aim : Inhibitory control stands as a pivotal executive function, empowering individuals to regulate their attention, behavior, thoughts, and emotions. It enables one to resist strong internal impulses and external distractions, guiding them to make appropriate decisions aligned with their goals. Studies have consistently highlighted the integral role of the frontal cortex in inhibitory control, showcasing a strong correlation between its activity level and the ability to suppress responses. Additionally, research has delved into the relationship between cerebral cortex metabolism, indicative of its activity, and brain wave patterns recorded through EEG. In this study, we aimed to investigate response inhibition using the go-no-go test while simultaneously measuring the activity of the frontal cortex through EEG recordings. Our objective was to assess commission errors and correlate it with the activity level of the frontal cortex. To quantify the frontal cortex activity, we calculated alpha power and beta power, shedding light on the intricate interplay between inhibitory control and neural activity.

Methods : In this study, a voluntary sampling method was employed, where students willing to participate in the research were selected after meeting specific criteria: absence of nervous system-affecting medications and no clinical psychological disorders. A total of 33 individuals met these conditions; after excluding three cases lacking necessary data quality, 30 participants were analyzed. The research utilized the Go No Go task, assessing control inhibition via error rates and attention through inappropriate inhibition errors. Brainwave data were recorded using the Mitsar EEG 201 device. Quantitative analysis of brainwave data was conducted using Neuro-Guide software, enabling the examination of alpha and beta power at frontal points.

Results : Utilizing Pearson's parametric test due to variable normality, the analysis revealed no significant correlation between commission errors and alpha or beta power. However, a notable finding emerged: omission errors exhibited no correlation with alpha power but demonstrated a strong inverse correlation with beta power. This indicates a decrease in omission errors with higher beta power, highlighting the intricate relationship between neural activity and omission error.

Conclusion : In explaining the first result, it can be said that the alpha wave is a more important component in the occipital and parietal regions, and therefore it cannot be relied on in the frontal region. Also, beta wave is not involved in response inhibition, which is investigated in this hypothesis. It is true that the beta wave is related to cognitive processes, but this relationship depends on the type of cognitive process and it is not related to all cognitive processes. Therefore, this lack of significance can be explained. To measure the activity level of the frontal region, beta power is a stronger component. As the results show, there is a strong inverse and significant relationship between beta power and omission error. An inappropriate omission error is a symptom of deficit in attention. The results of this research also showed that the decrease in beta is associated with a decrease in attention and an increase in omission errors.

Keywords : Response Inhibition, Attention, Alpha power, Beta power, QEEG

Count: 62
Abstract ID: 408
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The effect of mental fatigue on the validity of the attention networks test: the inhibition of return (IOR)

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Background and Aim : Mental fatigue represents a psychobiological state operationally defined as an acute increase in subjective ratings of fatigue and/or an acute decline in cognitive performance by prolonged periods of demanding cognitive activity that fatigued subjects had difficulties in focusing attention, planning, and changing strategies. Since attention is specifically affected by mental fatigue and during fatigue, attention is diverted to stimuli unrelated to the task, therefore mental fatigue impairs on the visual search and special attention. To undertake successful search behavior, there must be some mechanism to navigate attention to unreliable locations for sample information. Inhibition of return (IOR) has been nominated as such a mechanism. IOR refers to slower response time to the cued than uncued target. The time course of IOR has long been a topic of interest in the field. Furthermore, we expected that mental fatigue would impair the efficiency of validity in attention networks test with manipulating the cue-to-target interval which would be reflected by a decreased reaction time and increase error rate following mental fatigue

Methods : For this purpose, 22 elite's athletes volunteered to participate in this study. Experiment included two sessions, first session, the participants performed attention networks test (ANT), 48 hours after the first session, participants have recompiled the questionnaire Visual analogue scale (VAS) before the onset of the test. Then, to causes of mental fatigue, they performed the Stroop test for an hour, immediately after completing the Stroop test, they filled the questionnaire (VAS) for subjective assessment of mental fatigue and immediately they performed ANT. The validity effect of orienting is measured by the difference between valid and invalid cue conditions.

Results : The results of the analysis repetitive ANOVA 2*2 showed that in reaction time, validity affected by mental fatigue. As main effect of the time ($F(1, 22) = 10.36$; $p = .004$; $\eta 2 = .320$), the main effect of the condition ($F(1, 22) = 7.51$; $p = .01$; $\eta 2 = .25$) were significant and in accuracy the main effect of the time not was significant and only the main effect of the condition (F(1, 22)

=26.90; p =.001; η2 = .52) was significant. The validity effect was significant by mental fatigue for both RT [-488 ± 74 ms ; t(22) = -31.69; p < 0.001], and error rate [-9.36 ± 5.29%; t(22) = -.848; p > 0.05], indicating that the RT was longer and accuracy was smaller for the validity effect before mental fatigue compared to the validity effect after mental fatigue in attention networks test.

Conclusion : Results of the current study confirmed the effect of mental fatigue in increscent of RT validity networks. Our study showed that fatigued people had difficulties in sustaining attention and also in preparing their responses just as response speed decreased and ignoring irrelevant information. Mental fatigue leads to reduction in goal-directed attention. We found that mental fatigue as a failure to sustain attention to optimize task performance during mental fatigue and processing speed is reduced due to fatigue mental and might introduce temporary dysfunctions in the PFC and ACC to cause decreased parasympathetic and increased sympathetic activities.

Keywords : mental fatigue, validity, inhibition of return

Count: 63
Abstract ID: 285
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Covid-19 and mental health problems in college students: A narrative review of stress regulation and executive functions

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Background and Aim : -Globally, with the start of Covid-19 epidemic and the imposition of quarantine, mental health problems in different social and cultural classes became a threat to people's well-being (Prowse et al., 2021); A severe stressful situation such as the recent pandemic as a negative situation plays a role in causing anxiety, depression, reduced sleep quality, behavioral, cognitive and emotional problems (Córdova et al., 2023). College students are one of the sensitive groups and the risk of stress caused by the epidemic in the post-Covid-19 era, which due to the important role of this group in the educational system and the pursuit of societies development goals, preventive and therapeutic measures seem very necessary. Zeng et al., 2021). Stress, both chronic and acute, with affecting cognitive processes under the control of the prefrontal cortex (PFC), disturbs executive functions, including working memory, emotion regulation, cognitive flexibility, organization and planning, decision-making, and goal-directed behaviors as Possible mediators between perceived stress, attention and learning problems and make efficient cognitive processing difficult in tasks related to executive functioning (Lavigne-Cerván et al., 2021). Executive functions are a theoretical construct related to a set of cognitive processes that are related to how to manage and regulate people's thoughts and behavior (Diamond, 2013). Based on the studies, the educational aspects related to improving cognitive skills and executive functions are effective in improving the academic performance of college students and regulating the stress caused by Covid-19 (Pusateri, 2023). In this study, a narrative review was conducted to measure the effects of executive function interventions and stress regulation on the mental health of college students.

Methods : -Keywords were searched in reliable scientific databases such as "Google Scholar", "Pub Med", "Research Gate", "Nature", "SID" and "Nih" and 40 studies were analyzed based on the relationship with the field of study. The inclusion criteria included studies that dealt with the mental health problems of college students from the perspective of executive dysfunction and stress during the pandemic, obtained the minimum score in the evaluation of the quality of articles based on the list of Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA), and were prioritized in terms of access. Also described the resulting data in a categorized manner. Then, according to the exclusion criteria, irrelevant, repetitive, published in non-English language, outside the time frame of Covid-19, and articles whose full text could not be accessed were removed. Also, preventing the distortion of information, avoiding the conflict of interests were the ethical considerations observed in this research.

Results : -Based on the inclusion and exclusion criteria, the text of 14 studies was screened by the evaluator (first author).

Conclusion : Therefore, according to the same neural bases of executive functions, cognitive and metacognitive skills, the promotion of individual executive functions can expand the ability of creative thinking and enable college students to improve their coping ability in the face of public changes such as the recent pandemic; Therefore improve their physical and psychological health.

Keywords : Cognition, Executive functions, Mental health, Covid-19, Students, Review

Count: 64
Abstract ID: 436
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Evaluation of brain fog and problem solving ability in patients with breast cancer

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Background and Aim : Cancer as a chronic physical disease is one of the serious problems of the healthcare system in Iran and the world. People who are involved with this patient, besides physical problems and mental health problems, also experience cognitive problems such as brain fog, mental fatigue, decision making problem and problem solving. Because most of these cases occur as a result of chemotherapy. Therefore, the present study was conducted with the aim of evaluation of the brain fog and problem solving ability in patients with breast cancer.
Methods : The method of this research was causal-comparative. Participants were evaluated with diagnostic interview and demographic information questionnaire. The statistical population included all women with breast cancer undergoing chemotherapy and all non-cancer people in Rafsanjan in 1402. The sample of the present study was 38 patients with breast cancer and 38 subjects without cancer, who were selected by available sampling method. After that, Participants were evaluated with tools of Tower of London, multidimensional fatigue scale and brain fog measurement scale. In order to analyze the data and test the research hypotheses, multivariate covariance analysis was used with the help of Spss-26 software.
Results : Based on the results, patients with breast cancer had symptoms of brain fog and there were a significant difference between the scores of the two groups of patients and healthy group ($P<0.001$). With a detailed investigation, it was found that patients with breast cancer undergoing chemotherapy, they had brain fog; and their problem solving ability was greatly impaired compared to the healthy group.
Conclusion : The results of the research showed that patients with breast cancer had brain fog and slow thinking due to drugs and chemotherapy. This slowness of thinking and mental fatigue have affected their decisions in daily life and dealing with problems. Because they deal with subjects with less focus.
Keywords : brain fog, problem solving, patients with breast cancer.

Count: 65
Abstract ID: 256
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

A comparative study of Verbal fluency in MS patients and healthy individual

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Background and Aim : The aim of this study was to compare the verbal fluency of individuals with multiple sclerosis with normal individuals. For this study, two groups of 15 people were selected. The main group consisted of 15 individuals with RRMS of Firoozgar Hospital, who were treated with Rituximab and the next group which is called control group consisted of 15 healthy individuals were selected by convenience sampling method. After completing the special information form, twenty-question, proverb, word context and verbal fluency tests of Kaplan-Delis test were taken from both groups. Also, the homogeneity of the testers, both in the former and the later group, has cited in cases such as gender, education, age, etc. The result of research was performed by multivariate analysis of covariance and univariate t-test in each of .

Methods : The tool of this research was Delis and Kaplan high function language tests. Delis and Kaplan's high function test was designed and standardized in 2001 by Delis and Kaplan to measure and evaluate high level cognitive functions for children and adults (8 to 89 years old). Delis-Kaplan executive function test is a comprehensive set of internationally valid tests of executive functions that examines a wide range of executive-cognitive functions. The battery consists of nine tests that assess high-level cognitive function traditionally attributed to the frontal lobe. These nine scales include tracking test, verbal fluency, design fluency, color-word interference test, categorization test, twenty questions test, word texture test, tower test and proverb test. Several studies have been conducted to measure the psychometric properties of this set of tools (Fisher 2007). The 20-question test, the context of words and proverbs, deals with the comprehensive category of word production and verbal fluidity. And the test of verbal fluency in the first part, phonological fluency in the second and third part is also dedicated to semantic fluency.

Results : This research investigated, described and compared verbal fluency in MS patients and healthy people, and the results and findings, as reported in the detailed research findings, showed that healthy people in the verbal fluency test, the 20-question test , word context test and word context test have performed better. And the final result was that patients with MS have a weaker performance in semantic fluency, verbal comprehension, word context comprehension and saying the meaning of proverbs than healthy people. And referring to previous researches, the reason for the low performance of patients with MS in verbal fluency and classification is more related to memory performance and weakness in phonological fluency and switching is related to executive performance. And our study showed that Persian- Language MS sufferers have disorders in these areas as well, and this finding is the result of this research. This finding was investigated on other languages and we have verified these results for the first time on Persian speakers with MS.

Conclusion : According to the results of the present study and its alignment with research conducted in other languages, it can be said that patients with Persian MS have less verbal fluency than healthy people. Also, the results of this research show that there is a significant difference in verbal comprehension between two groups of MS patients and healthy people. Healthy people scored better than people with MS on the 20-question verbal skills test.

Keywords : multiple sclerosis .MS. verbal fluency. Delis-Kaplan Executive Function System (D-KEFS)

Count: 66
Abstract ID: 231
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The effectiveness of anodal tDCS on the mPFC of individuals with obsessive-compulsive disorder background, in decision-making under ambiguity

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Background and Aim : In today's unpredictable world, decision makers are constantly involved in choosing between options with uncertain outcomes. Uncertainty is an all-encompassing feature and an integral part of human daily life, which includes two states of risk and ambiguity. Neuroscientific studies suggest that the dorsolateral prefrontal cortex (DLPFC) primarily impacts decisions under risk whereas the orbital frontal cortex (OFC) affects ambiguity.

Methods : We targeted the medial prefrontal cortex (mPFC) with transcranial direct current stimulation (tDCS) and observed enhanced decision-making function in ambiguous situations in individuals with obsessive-compulsive disorder (OCD) background. In this study, 20 patients with obsessive-compulsive disorder background (n=20) were randomly assigned to receive either experimental (active) or control (sham) tDCS. To measure decision-making function, the participants underwent iowa gambling task (IGT) and to measure OCD severity, the Yale-brown obsessive-compulsive scale (Y-BOCS) was used. The parameters of active tDCS included administration of 2 mA for 20 minutes, anode electrode over Fpz, and cathode electrode over the Oz region.

Results : The net scores of the group that received real stimulation differed significantly ($P < 0.05$) from the net scores of the same blocks in the control group, in blocks 1 and 2 of the IGT task, which measure decision-making under conditions of ambiguity.

Conclusion : We found evidences that modulating the activity of the mPFC using anodal tDCS significantly enhanced the participant's decision-making function in an ambiguous situation.

Keywords : ambiguity; decision-making; transcranial direct current stimulation; medial prefrontal cortex; obsessive-compulsive disorder; Iowa gambling task

Count: 67
Abstract ID: 656
subject: Cognition: Cognitive Aging
Presentation Type: Poster

The Potential Therapeutic Impact of Simvastatin in Ameliorating Neuroinflammation and Cognitive Deficits in Alzheimer's Disease: An Experimental Study in Wistar Rats

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Background and Aim : Alzheimer's disease stands out as a prevalent age-related neurodegenerative condition, characterized by a progression of symptoms including memory loss, cognitive decline, alterations in personality, and language impairments. Among the various contributing factors, neuroinflammation has gained significant recognition for its potential role in the pathology of Alzheimer's disease (AD). Simvastatin, a notable lipid-lowering agent, is known for its anti-inflammatory properties. This study aims to investigate whether simvastatin can ameliorate cognitive deficits and modulate inflammatory factors in animal model of Alzheimer's disease.

Methods : Thirty female Wistar rats, aged between 16 and 18 months, were randomly assigned to three groups (n = 10 each): Sham Operated group (SO) - Animals in this group underwent surgery without ovariectomy and were administered intraperitoneal normal saline daily for 10 weeks. AD-like group (OV/D-gal) - Animals in this group underwent ovariectomy and received intraperitoneal D-gal daily (150 mg/kg) for 10 weeks. Simvastatin-treated group (OV/D-gal/SV) - Animals in this group underwent ovariectomy, received intraperitoneal D-gal daily for 10 weeks, and were treated with oral administration of simvastatin (5mg/kg) for 4 weeks. Following the behavioral test (Novel Object Recognition (NOR)), the level of brain tissue inflammation was evaluated by measuring NF-Kb and IL-1β, in addition to a histological examination using H&E staining.

Results : Simvastatin exhibited a noteworthy reduction in NF-Kb and IL-1β levels within the treatment cohort when contrasted with the D-galactose group. These alterations in physiological parameters resulted in improved performance in behavioral tasks for the treatment group as opposed to the D-galactose group.

Conclusion : In conclusion, the administration of Simvastatin led to a significant decrease in neuroinflammation in the treatment group compared to the D-galactose group. These physiological changes were associated with enhanced performance in behavioral tasks within the treatment group, highlighting the potential therapeutic impact of Simvastatin in ameliorating neuroinflammatory responses and cognitive deficits observed in conditions such as Alzheimer's disease.

Keywords : Simvastatin, Neuroinflammation, Cognition, Alzheimer's Disease

Count: 68
Abstract ID: 247
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Investigating the effectiveness of Unified transdiagnostic protocol on emotion regulationss & persistence on treatment in patients undergoing methadone maintenance trerapy

Submission Author: Zahra Mokhtari

Zahra Mokhtari[1], Zahra [2], Maryam[3], Sahar[4]

1. -
2. Mokhtari
3. Izadi Mazidi
4. Eshrati

Background and Aim : According to the 5th Diagnostic and Statistical Manual of Mental Disorders, Addictive Disorders, which comprise a wide range of emotional disorders, are considered one of the most common psychological disorders. These disorders have a very high coexistence and this condition imposes many direct and indirect costs on the society.

Methods : This is a semi-experimental research with a pre-test-post-test design, along with a control group. After coordination with the officials of the addiction treatment clinics and after that, explanations to the officials and clients of the clinic regarding how to conduct the research, how to complete the questionnaires and the process of the meetings, the people who had the entry and exit criteria and a sufficient score in the questionnaire. , DERS, obtained, were selected as samples. Then the subjects were randomly placed in two experimental and control groups. The experimental group with the number of 22 members was started by the therapist to implement the integrated metadiagnostic protocol, and the control group was also on the waiting list.90-minute sessions and one session per week were held. After the completion of the treatment, in the post-test, the mentioned questionnaires were taken again from both groups and finally the data was analyzed.

Results : The results of the research showed that after adjusting the pre-test scores, a significant difference was observed between the experimental and control groups in terms of emotion dysregulation ($P<0.01$, $F=613.3$). In other words, the integrated metadiagnostic protocol has reduced emotion dysregulation and can be a way to increase treatment retention.

Conclusion : The results showed that people who suffer from emotional problems cannot form healthy interpersonal relationships and have problems accepting personal and social responsibilities in life. Therefore, the idea that integrative transdiagnostic therapy can reduce emotional problems is useful.

Keywords : Integrated meta-diagnostic treatment, emotion regulation, adherence to treatment, maintenance treatment, methadone.

Count: 69
Abstract ID: 124
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Usefulness of Contrast Agents and Molecular Markers in PET and SPECT Imaging on Animal Models for Alzheimer's Diagnosis

Submission Author: Yasaman Abaszadeh

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Background and Aim : A growing older population and altering lifestyles have made cognitive decline more significant. Although in vivo imaging is becoming closer to this diagnosis, an accurate diagnosis of Alzheimer's disease (AD) can only now be made by postmortem histological testing. The efficacy of contrast agents and compounds has not been extensively studied in the present literature, despite the importance of early Alzheimer's disease detection and diagnosis. We conducted an extensive investigation using PET and SPECT imaging to assess the function of these agents and markers in identifying the illness in order to fill this diagnostic gap.

Methods : The PRISMA guidelines were followed when doing a thorough search in PubMed, with no time or language limitations. The papers were examined by three independent researchers based on the inclusion criteria, and pertinent information was taken and analyzed from the included articles.

Results : 172 original articles that were found during the initial search were added to the research. Information from 116 studies was retrieved. The most often employed transgenic mouse strains in the studies were APP/PS1 (35 studies, 30.1%) and 5XFAD (11 studies, 9.5%). PET imaging was employed in 100 research (86.2%), SPECT imaging in 13 studies (12.9%), and both scans were used in 2 studies (1.7%). 94% of the studies' utilization of [18F] Fluorodeoxyglucose produced the intended outcomes among the contrast agents. Additionally, 94.4% of the usage of [11C] Acetate and 90% of the use of Iodine-based chemicals resulted in the desired outcome, and 95% of the use of other contrast agents—which were employed less frequently—such as 99mTechnetium, Fluselenamyl, Copper (Cu) labeled benzofuran derivatives, etc.—also produced the desired outcomes. Amyloid beta was identified as a biomarker in 57 studies (49.1%), Tau protein was identified in 13 (11.2%), Translocator protein (TSPO) was identified in 8 (6.9%), Acetylcholinesterase (AChE) was identified in 6 (5.2%), Monoamine oxidase B (MAO-B) was identified in 2 (1.7%), Gonadotropin-releasing hormone receptor (GnRHR) was identified in 2

(1.7%), and other biomarkers were identified in 13 studies (11.2%). This was not covered by 21 studies (18.1%).

Conclusion : A few of the study's flaws must be acknowledged, though. First of all, since only animal models were employed, it's possible that the findings won't translate accurately to humans. It is necessary to conduct additional research on the effectiveness of these contrast agents and molecular markers in clinical situations. Given that the study did not assess the long-term effects or safety of the contrast chemicals used, future research should take this into consideration. More research is needed in order to verify these outcomes in clinical settings and assess the long-term effects and safety of the contrast chemicals used. This study suggests that, when combined with the appropriate contrast agents and molecular markers, PET and SPECT imaging may be helpful diagnostic techniques for Alzheimer's disease. As a whole, this study improves our understanding of Alzheimer's disease diagnosis and opens the way for more research in this field.

Keywords : Alzheimer's Disease; Single Photon Emission Computed Tomography (SPECT); Positron Emission Tomography (PET)

Count: 70
Abstract ID: 349
subject: Cognition: Consciousness
Presentation Type: Poster

Assessment of Sleep Disorder in Delirious and Non-Delirious Patients in Medical Intensive Care Unit: a cross sectional study

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Background and Aim : Sleep disorder is a common problem in critically ill patients. Sleep deprivation can cause several complications such as emotional stress, delirium and immune system dysfunction. Delirium is also a common phenomenon in intensive care unit (ICU) patients.

Methods : The purpose of this study was to assess circadian rhythm sleep-wake disorders in patients with delirium and those without delirium in the internal ICU between 21 April 2020 and 20 May 2022.

Results : Among patients admitted to the internal ICU, according to the confusion assessment method (CAM-ICU), 10 patients had a diagnosis of delirium and 10 patients without delirium were enrolled in our study, and assessment of sleep/wake cycle was performed by actigraphy device and recording the motor activity. The study showed that the amount of sleep-wake time significantly was different between the two groups ($P<0.05$). Also, the length of hospital stay was significantly higher in the group of patients with delirium ($P<0.05$), but the mortality rate was not significantly different in two groups ($P>0.05$).

Conclusion : Overall, patients with delirium admitted to the ICU spent more time in sleep during a 24-hour period, but their sleep was disturbed and had not enough quality, which other factors may be associated with these problems.

Keywords : delirium, circadian rhythm, actigraphy, CAM-ICU

Count: 71
Abstract ID: 587
subject: Cognition: Attention
Presentation Type: Oral

Effects of Reward and Punishment on Reaction Time and Performance During a Target Selection Task

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Background and Aim : Studies of attentional priority for visual information processing suggest that reward can create biases in perceptual and motor systems, causing individuals to orient their eyes toward reward-associated stimuli. Reward-driven attentional priority is larger when the stimulus is associated to a high reward compared to a low reward. However, the impact of punishment on attentional capture is less investigated. It is unclear whether the punishment affects attentional priority in the same way or as apposite to the reward.

Methods : Here, we designed two experiments to investigate the potential impact of reward/punishment on reaction time and performance during a target selection task. In Experiment 1, two Gabor patches are appeared simultaneously in the visual field of the subject who is fixating to the center of the screen. One of the patches is a 90-degree Gabor (i.e., the vertical Gabor), while the other is tilted to have an angle of θ which is designed to have five different logarithmically spaced values (i.e., nonvertical Gabor). The subject is instructed to move his/her eyes from the central fixation point to the nonvertical Gabor, as quickly as possible. Nine subjects (age range 16 to 28 years) participated in the experiment. Eye movements were registered with Bina eye-tracker system (Zist Kankash Toos Co.). Psychometric functions of the reaction time and performance were investigated for extracting the best θ angles. In Experiment 2, we further added three cues with different colors associated with three different values of the reward/punishment (i.e., +100 points, +5 points as the neutral cue and -100 points). For each condition, a cue frame is presented to the subject prior to the appearance of the Gabor patches. The cue is presented as an arrow with one of the mentioned three colors toward the nonvertical Gabor (75% trials) and vertical Gabor (25% trials). The subjects receive reward/punishment based on the cue color and their performance

while selecting the target Gabor. Reaction time and performance are investigated to be compared in different conditions.

Results : Results of Experiment 1 showed that adjusting θ to have five logarithmically spaced values between 60 and 90 degrees yields the best results. Moreover, the findings revealed a significant increase in reaction time ($R2 = 0.809$, $p < 0.018$) and a significant decrease in performance ($R2 = 0.676$, $p < 0.043$) as the angle of non-vertical Gabor was inclined to 90 degrees. Experiment 2 is already designed, going to be conducted in a while.

Conclusion : This specific design of the saccadic target selection experiment can be used in many psychophysical experiments which intend to study various cognitive functions such as the attention, decision making, problem solving, memory, learning and perception, as well as studies which focus on investigating psychological or cognitive disorders. Future results of the Experiment 2 will also be highly valuable as they address an important question of whether it is the valence (positivity of reward) or motivational salience (of both reward and punishment) which affect visual attention.

Keywords : Target Selection; Atenitional Capture; Psychometric Functions; Reward; Punishment

Count: 72
Abstract ID: 275
subject: Cognition: Attention
Presentation Type: Poster

The Effect of Danger Ideation Reduction Therapy and Attention Reinforcement Techniques on the Attention of Patients with Obsessive-Compulsive Disorder

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Background and Aim : Possible damages and abnormalities in the brain of obsessive-compulsive patients cause their defects in various functions including cognitive processes. This study investigated the effect of Danger Ideation Reduction Therapy (DIRT) and the techniques of attention enhancement on the attention of patients with obsessive-compulsive disorder (OCD).

Methods : The research method was experimental with pre-test post-test control group design. two hundred female bachelor and master students aged between 22 and 28 were chosen from the student at Golestan university. Maudsley obsessive-compulsory inventory was given to them. based on their scores on Maudsley Obsessive-Compulsive inventory 12 participants, were randomly selected among those who met the primary requirements by manifesting ‘washing compulsion’ In addition, a psychiatrist confirmed the appropriateness of the sample selection. Consequently, they were assiged into the control and experimental groups. before the treatment , Both groups at the first step , were tested by stroop test.It was performed for ten weeks, and each week in two sessions and each test takes approximately 90 minutes.

Results : The experimental group showed a significant improvement ($p > 0.01$) after the treatment on stroop test as the post-test as well as in the follow-up.

Conclusion : The findings confirmed the results from the previous research in that the patients suffering from OCD demonstrated some deficits in their cognitive components such as attention.thus a combination of suggested DIRT and attention reinforcement techniques will be useful to improve the attention.

Keywords : Obsessive-Compulsory Disorder, Danger Ideation Reduction Therapy, Attention, Reinforcement

Count: 73
Abstract ID: 311
subject: Cognition: Attention
Presentation Type: Poster

The role of gut microbiota-brain axis in pathophysiology of ADHD: a systematic review

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Background and Aim : -The main goal of this systematic review is to summarize evidences regarding alterations of microbial composition in ADHD cases and uncover underlying mechanisms.

Methods : -A comprehensive search was conducted on PubMed, Web of Science, and Scopus databases up to March 2021. All the observational studies including case-control, cross-sectional, and cohorts investigating the correlations between the gut microbiota and ADHD in both adults and children were included.

Results : -We found eight eligible studies. Enterococcus, Bifidobacterium, and Odoribacter were increased which may lead to impaired dopamine related functions in CNS. Moreover, decrease of Faecalibacterium frequency in ADHD could result in higher permeability and crossing of inflammatory cytokines. Regarding the short chain fatty acids-producing bacteria, Ruminococcaceae family decreased and Bacteroides uniformis and Bacteroides ovatus species increased.

Conclusion : Gut microbiota correlation with ADHD and its underlying mechanisms could open new windows for developing novel therapies of ADHD by manipulating microbiota.

Keywords : ADHD; gut-brain axis; gut microbiota; short chain fatty acids

Count: 74
Abstract ID: 425
subject: Cognition: Attention
Presentation Type: Poster

Effectiveness of Multipurpose Intervention on attention, working memory in schizophrenic Patients

Submission Author: Razieh Khanmohammadi

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Background and Aim : The cognitive deficits experienced by schizophrenic patients, such as impairments in working memory and sustained attention, are known to greatly affect their daily functioning , and drug treatments have shown limited effectiveness in addressing these impairments. The interest in exploring the effects of non-pharmacological interventions has grown due to the limited impact of drug treatments on improving cognitive deficits observed in these patients. Various studies have confirmed the positive effects of listening to music such as improving attention and memory. physical exercise interventions and cognitive rehabilitation are other techniques that enhance the cognitive performance of individuals suffering from schizophrenia. Physical activity boosts the level of growth in the gyrus of the brain. as well as enhances the volume of the hippocampus.Cognitive rehabilitation is an effective approach that improves people's performance by targeting cognitive areas. During the initial phase of schizophrenia, cognitive rehabilitation interventions have the ability to mitigate or partially reverse the gradual decline in brain volume within specific regions (such as frontal cortex, thalamus, hippocampus and amygdala) that play a crucial role in significant cognitive functions. or cognitive rehabilitation may improve brain function in the frontal and temporal regions that play a role in cognitive improvement through brain plasticity processes. this semi-experimented study aimed to explore the potential benefits of incorporating complementary methods alongside other treatments for schizophrenic patients.

Methods : For that, 72 patients were estimated as a sample size by using G*power software and put in 6 groups. The patients have participated in interventions consisting of Aerobic exercise, Cognitive rehabilitation, Music therapy, and a combination of them for 12 weeks. Data were

collected using Mini-Mental State Examination, Continuous Performance, and N-back test; then, were analyzed in SPSS® 26.0 software.

Results : The results of paired t-test showed that working memory and quality of life (psychosocial, cognition vitality) improved significantly in all research groups from pre-test to post-test (P?0.05). Also, the results of the paired t-test showed that Continuous Performance (omission error, commission error) improved significantly in the Aerobic, Music, ACR, AM, and CRM groups from the pre-test to the post-test (P?0.05), The ANOVA test results showed that after removing the pre-test effect, there is a significant difference between the post-test scores of working memory, Continuous Performance (omission error, commission error) and quality of life (psychosocial, cognition vitality) in the research groups (P?0.05). The result showed improvement in cognitive ability in all groups; the combination of the aerobic and the cognitive rehabilitation group displayed a higher outcome in working memory while the combination of aerobic and music group in sustained attention. However, cognitive rehabilitation was an exception in sustained attention and has not exhibited significant improvement after interventions.

Conclusion : The interventions of music therapy, aerobic exercise, and cognitive rehabilitation were found to significantly improve working memory, sustained attention in the present study. Given the current situation where schizophrenic patients pose a significant burden on governments in terms of expenses and repercussions, due to the requirement of hospitalizations for over half of them, it is advisable to prioritize utilizing these interventions within psychiatric centers for the rehabilitation of such individuals.

Keywords : Keywords: working memory, sustained attention, Aerobic exercise, Cognitive rehabilitation, Music therapy

Count: 75
Abstract ID: 226
subject: Cognition: Attention
Presentation Type: Oral

Olfactory epithelium stimulation using air-puff improves the cognitive performance of individuals with acute sleep deprivation

Submission Author: Hanieh Riazi

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Background and Aim : Acute sleep deprivation, which affects more than 30% of the global population, leads to cognitive impairments such as reduced alertness and decreased attention. However, there is still no effective and feasible solution to improve cognitive performance in these individuals. Given the reported effects of nasal air-puff application as a non-invasive brain stimulation method in increasing the power of brain higher-frequency oscillations, especially the gamma band, this study aimed to investigate the effects of nasal air-puff application following acute partial sleep deprivation on improving cognitive impairments in a numerical stroop test in adult male and female volunteers.

Methods : In this study, 26 male and female volunteers underwent electroencephalography (EEG) and a numerical stroop test on the first day, and their data were considered as their baseline performance. They were then instructed to sleep only between 3 a.m. to 7 a.m. for the next 24 hours and stay awake for the rest of the time. On the following day, the control group participants performed the numerical stroop test after their usual breathing pattern, while in the treatment group, nasal air-puff (5 Hz) was applied to the volunteers for 3 minutes before performing the numerical stroop test, and the effects on EEG activity and cognitive performance in the numerical stroop test were examined.

Results : One night of acute sleep deprivation resulted in increased error rate, decreased reaction time, and reduced percentage of missing rate in the control group compared to the baseline day. However, following the nasal air-puff administration in the treatment group, no significant differences in these variables were observed following sleep deprivation compared to the baseline day. Additionally, after sleep deprivation, the power of low-frequency oscillations in EEG, including delta and theta, increased, while the power of high-frequency rhythms, including beta and gamma, decreased in various brain lobes. The EEG signal complexity also decreased in some regions following sleep deprivation. Nasal air-puff application interestingly was able to restore the

power, particularly in the beta and gamma bands, close to the values of the baseline day and to increase EEG signal complexity following sleep deprivation. Furthermore, nasal air-puff administration increased the functional connectivity between the default mode network areas, particularly in higher frequency bands (in the gamma range).

Conclusion : The present study demonstrates that nasal air-puff application can improve acute sleep deprivation-induced cognitive impairment. Applying nasal air-puff performs part of its function by restoring neuronal activity in brain areas involved in cognitive functions.

Keywords : nasal air-puff, acute sleep deprivation, electroencephalography, numerical stroop test, cognitive function, olfactory epithelium.

Count: 76
Abstract ID: 230
subject: Cognition: Attention
Presentation Type: Poster

Ameliorating effect of nasal breathing on individuals cognitive performance following one night of partial sleep deprivation

Submission Author: Hanieh Riazi

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Background and Aim : Given the cognitive performance impairment following acute sleep deprivation and the role of nasal breathing in the neuronal activity of various brain regions, in this study, the effect of nasal breathing on individuals' cognitive performance in the numerical stroop test (NST) and activity of the default mode network (DMN) following one night of partial sleep deprivation were examined.

Methods : In this study, 26 male and female volunteers underwent electroencephalography (EEG) and NST on the first day, and their data was considered as the baseline performance. Then they were asked to sleep from 3 a.m. to 7 a.m. in the next 24 hours and stay awake for the rest of time. EEG and NST were recorded 24 hours later. Before performing the NST, the control group breathed normally, but in the treatment group, the volunteers performed nasal breathing for 3 minutes before starting the NST.

Results : One night of acute sleep deprivation resulted in increased error rate, decreased reaction time, and reduced percentage of missing rate in the control group compared to the baseline day. However, following the nasal breathing in the treatment group, no significant differences in these variables were observed following sleep deprivation compared to the baseline day. Additionally, nasal breathing increased the functional connectivity of different regions of the DMN, particularly in higher frequency bands (in the gamma range).

Conclusion : The present study demonstrated that nasal breathing can improve acute sleep deprivation-induced cognitive impairment. Nasal breathing performs part of its function by restoring the functional connectivity of brain areas. Then, it is suggested to develop non-invasive methods for stimulation of olfactory epithelium to enhance cognitive function following sleep deprivation.

Keywords : nasal breathing, acute sleep deprivation, numerical stroop test, default mode network

Count: 77
Abstract ID: 650
subject: Cognition: Neurolinguistics
Presentation Type: Poster

Understanding the Dynamic Interplay between Language and Visual Perception

Submission Author: Narges Kazerooni

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Background and Aim : This review delves into the intricate relationship between language and visual perception, exploring their synergistic effects in shaping cognitive processes. Acknowledging the significance of both modalities in human cognition, this article aims to synthesize existing literature to provide a comprehensive understanding of the interplay between language and visual perception.

Methods : A systematic review methodology was employed to identify and analyze relevant studies from various databases. Inclusion criteria were established to ensure the selection of studies employing diverse methodologies, encompassing behavioral experiments, neuroimaging, and computational modeling. This methodological diversity aimed to capture the breadth and depth of research exploring the dynamic interrelationship between language and visual perception.

Results : The synthesis of findings reveals intricate connections between language and visual perception across multiple cognitive domains. Studies elucidate how linguistic information influences visual attention, alters perceptual processing, and shapes higher-order cognitive functions. Additionally, investigations into the neural correlates highlight the neural substrates implicated in the integration of language and visual information.

Conclusion : Drawing from the amalgamation of results, this review underscores the bidirectional influence of language and visual perception. It emphasizes the need for an integrated theoretical framework that acknowledges their mutual impact on cognitive processes. The article concludes by discussing the implications of these findings for advancing our understanding of cognitive psychology and proposes avenues for future research to explore the intricacies of this intertwined relationship.

Keywords : language, visual perception, cognition

Count: 78
Abstract ID: 59
subject: Cognition: Neurolinguistics
Presentation Type: Poster

The Neural Dissociation of Number/Person Features: a Review of Neurolinguistic Studies

Submission Author: Simin Meykadeh

Simin Meykadeh[1]

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Background and Aim : Recent years have seen an increased understanding of the processing of Number-Person features agreement. To consolidate current knowledge on the topic, I perform a brief review of studies that validate dissociative processing of Number/Person features using fMRI and ERPs. A total of 5 articles were identified and included in the review.

Methods : Using Spanish and Basque sentences with pronominal subjects containing agreement violations of three types of Number disagreement, Person disagreement and Number and Person disagreement, two ERP studies (Silva-Pereyra and Carreiras, 2007; Zawiszewski et al., 2016) observed no qualitative differences between Number and Person violations. But their findings revealed quantitatively larger ERP signatures for Person as compared to Number violations. The other relevant studies are reported by Mancini et al. (2011) and Mancini et al. (2017), who use ERP and fMRI respectively. In both works, authors tested Spanish sentences with an R-expression as subject, containing an agreement errors of two types of Number disagreement and Person disagreement. In the ERP study, the results revealed that in the detection phase Person behaves the same as Number, but the repair of Person violations was more costly than repair of Number violations. In the fMRI study, the direct contrast between Person and Number violations showed a greater response for Person compared to Number in the left middle temporal gyrus (LMTG). Furthermore, authors observed that the posterior portion of the LMTG was sensitive to both Person and Number violations, whereas its anterior portion showed selective response for Person violations. More recently, Meykadeh et al. (2023) have investigated the neural correlates of Number/Person agreement processing in an fMRI study, using specific controllers for Number and Person violations (i.e. the former contained R-expression as subject and the latter contained Pronoun as subject) in order to better understand the nature of the subject. In this work, activation patterns in the frontotemporal network demonstrated quantitative and qualitative differences

between processing two features. Specifically, the sensitivity of the posterior Superior Temporal Gyrus was detected for both Number and Person violations, whereas the Pars opercularis was active only for Number violations. Meykadeh and her colleagues proposed the involvement of systematically different feature-checking and feature-mapping mechanisms in Number and Person agreement.

Results : In the context of fMRI, depending on which controller (i.e., R-expression or Pronoun) for Number/Person features are picked out by an experimental paradigm, the brain response differed. In the situation where both violations contained a clash in feature specification, a larger effect for Number compared to Person violations was observed. In the case of no clash for a specific violation, a stronger response for Person as compared to Number feature was observed.

Conclusion : Findings from this literature survey illustrate that clash type selection significantly impacts the quantitative and qualitative differences between processing two features. To enhance the knowledge in the field of phi-features processing, future studies should adopt R-expression and Pronoun as subject but only use Number violation instead in order to elucidate the nature of the subject.

Keywords : Number feature, Person feature, feature-mapping mechanism, feature-checking mechanism

Count: 79
Abstract ID: 44
subject: Cognition: Neurolinguistics
Presentation Type: Oral

No Effect of Biological Sex on Syntactic Processing: Evidence from ERPs and Balanced Bilinguals

Submission Author: Simin Meykadeh

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Background and Aim : Psycholinguistic studies put forward that males and females adopt different language processing strategies. The contribution of gender in education and how it may manipulate the L2 processing have also been recognized. However, there has been little investigation of the syntax between males and females. Syntax has long been a central issue in linguistics as the core of the generative nature of language. Here, I report results from an electroencephalogram experiment with bilingual (Turkish (as L1)/Persian (as L2)) PhD students (from top public universities in Tehran).

Methods : I used event-related brain potentials (ERPs) to determine whether bilingual female have outperformed bilingual male on syntactic processing. To this end, a grammaticality judgment task was presented auditorily in two conditions: (1) syntactically correct sentences and (2) syntactically incorrect sentences. The last syllable of the sentence final word was the target syllable. All stimuli were in Persian, a language with canonical Subject-Object-Verb (SOV) word order. ERPs analyses were compared between male and female brains, including 30 healthy individuals (15 females, 15 males) using the right hand between aged 23 to 34 years old. All bilinguals had acquired Persian at the age of seven at school and were matched for proficiency in L2. Both groups were controlled for age, handedness, L1 and L2 proficiency, socioeconomic status, language dominance and verbal working memory. Mean amplitudes were analyzed for ten anterior regions of interest (ROIs) and thirteen posterior ROIs. Within each ROI amplitudes were averaged for the following intervals: (1) 300-500 ms (left anterior negativity; LAN) and (2) 500-700 (posterior positivity; P600). LAN and P600 have been associated with syntactic sentence processing.

Results : The P600 effect for morphosyntactic violations vs. morphosyntactic corrects was replicated, with no cue of a LAN preceding the P600. Surprisingly, (based on the present task and

sample) females were indistinguishable from males in terms of performance and neural signals of syntactic violations, indicating that exposure to a second language at school entry and being highly proficient with L2 may significantly eliminate the effects of the biological sex.

Conclusion : These findings did not suggest the maturation of language-related brain areas in females and highlight the importance of proficiency and the effect of environmental factors on bilingualism. These results may explain findings of similar performance in previous behavioral studies.

Keywords : Bilingualism, P600, Language Proficiency

Count: 80
Abstract ID: 479
subject: Cognition: Neurolinguistics
Presentation Type: Poster

A narrative review of the anatomy and function of the white matter tracts in language production and comprehension

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Background and Aim : Much is known about the role of cortical areas in language processing. The shift towards network approaches in recent years has highlighted the importance of uncovering the role of white matter in connecting these areas. However, despite a large body of research, many of these tracts' functions are not well-understood.
Methods : We present a comprehensive review of the empirical evidence on the role of eight major tracts that are hypothesized to be involved in language processing (inferior longitudinal fasciculus, inferior fronto-occipital fasciculus, uncinate fasciculus, extreme capsule, middle longitudinal fasciculus, superior longitudinal fasciculus, arcuate fasciculus, and frontal aslant tract).
Results : For each tract, we hypothesize its role based on the function of the cortical regions it connects. We then evaluate these hypotheses with data from three sources: studies in neurotypical individuals, neuropsychological data, and intraoperative stimulation studies. Finally, we summarize the conclusions supported by the data and highlight the areas needing further investigation.
Conclusion : Much has already been learned about the network involved in processing language production and comprehension, including the white matter pathways that connect various cortical regions. The field has moved beyond the general question of whether a tract is or is not involved in language processing and has reached a state of probing the nuanced nature of such involvement. This is an excellent time for combining theoretically inspired approaches with neural investigations. Specifically, the review above shows the need for moving away from paradigms that confound multiple operations, e.g., verbal fluency tasks, and towards those that can better tease apart cognitive components such as semantic activation vs. semantic control, phonological activation vs. phonological buffering, and pure syntactic operations vs. domain-general processes that support such operations.
Keywords : language, white matter, dorsal and ventral pathways, inferior longitudinal fasciculus, inferior fronto-occipital fasciculus, uncinate fasciculus, arcuate fasciculus, frontal aslant tract

Count: 81
Abstract ID: 534
subject: Cognition: Neurolinguistics
Presentation Type: Poster

Dissociation of semantic processing of action verbs and non-action nouns in Persian

Submission Author: Elahe Alibareshi

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Background and Aim : The sensory-motor processing of a word's meaning, and the difference between nouns and verbs, is the main topic of neurolinguistic research. This study aimed to examine the semantic processing of Persian non-action nouns and action verbs using a semantic similarity judgment task.

Methods : Sixty-two neurologically intact Persian speakers responded to a computerized semantic similarity judgment task (SSJ) by key pressing. In designing the SSJ task, 34 common action verbs and 34 non-action objective nouns of the Persian were selected. For each word, one semantically related word was selected based on functional, physical, categorical, and similarity in action, and one semantically unrelated word was selected based on a survey by 4 experts. Lexical and psycholinguistic features of each stimulus were extracted by 18 volunteers based on a 7-point scale. Finally, 34 verb triplets with high action association and 34 triplets with low action association were selected. Response time (RT) and percentage error were considered indirect measures of semantic encoding efficiency. The latency of hand movement execution with no linguistic demand was assessed for each participant.

Results : The results showed that the percentage error of action was significantly higher than object nouns ($p<.001$); moreover, the RT of action verbs was significantly slower, compared to

non-action nouns($p<.001$). Mixed ANOVA revealed that the observed noun/verb dissociation was not affected by biographical facors ($p>0.05$).

Conclusion : Our finding indicates that semantic encoding of Persian verbs, compared to non-action nouns, requires more support from cognitive sources during the processing of the motor-related semantic feature. The different processing of action verbs in terms of semantic view and embodied cognition theory are suggested.

Keywords : Action; Verbs; Nouns; Object; Semantic processing; Persian

Count: 82
Abstract ID: 584
subject: Cognition: Other
Presentation Type: Poster

Risk of cognitive decline in patients with heart failure

Submission Author: Atefeh Rahimi

Atefeh Rahimi[1]

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Background and Aim : -Cognitive impairment (CI) is prevalent in heart failure (HF). Patients with HF demonstrate reduced global cognition as well as deficits across multiple cognitive domains. The extent of CI may be linked to HF severity. There is an established association between HF and an elevated risk of dementia. Structural alterations in the brain, such as gray matter and increased white matter lesions have been observed in patients with HF. Various proposed Pathophysiological pathways relating HF and CI , including cerebral hypoperfusion due to changes of cardiac output or cerebrovascular reactivity, arterial hypotension, impaired cerebrovascular autoregulation, production of proinflammatory cytokines, proteotoxicity and thromboembolic diseases.the precise mechanisms remain far deeply understood. Individuals with HF and CI experience poorer functional independence and self-care, heightened rehospitalizations and increased mortality. On the other hand, Neurological comorbidities including stroke, depression, cognitive decline, and autonomic dysfunction have received limited attention in recent HF guidelines, despite their common occurrence and difficult management.

Methods : -Upon searching on MEDLINE, Embase and Scopus for original research on HF and CI connection, it is evident that multiple validated questionnaires such as the Mini-Mental Status Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) are existed for screening and to some extent, grade cognitive impairment.

Results : -According to nearly 30 studies, In heart failure patients, overall prevalence for cognitive impairment and dementia was approximately 40% (CI) and 20% (dementia) respectively meta-regression analysis reveals that the risk of cognitive impairment and dementia increases with age emphasizing the importance for clinicians to assess and address these conditions.

Conclusion : Assessment of cognitive functioning, even through simple screening tests, should be an integral part of routine clinical examinations for HF patients. Despite advancing data in clinical practice, CI remains a significant challenge for clinicians.

Keywords : Heart failure; cognitive impairment; cognitive decline; age; pathophysiology

Count: 83
Abstract ID: 600
subject: Cognition: Other
Presentation Type: Poster

Comprehensive Eye-Tracking Analysis of Global-Local Processing in Selective Attentional Tasks

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Background and Aim : Local global processing refers to how the brain processes information simultaneously at the local and global levels. Global precedence(GP) is the cognitive phenomenon in which individuals prioritize processing global features before attending to local details when perceiving complex stimuli. The investigation of global precedence through the analysis of eye-tracking data holds significant academic and professional relevance, as it illuminates the cognitive mechanisms governing the prioritization and processing of visual information, thereby informing disciplines encompassing cognitive science and education.

Methods : In a controlled experiment, fourteen participants were tested individually in a quiet, dimly lit room. They were presented with a selective Navon task and instructed to compare two Navon stimuli in a selected target level(local or global). We extracted the main eye movement features, including Fixation duration(FD), Number of fixations(NF), Visual Field(VF), Saccade distance (SD), Saccade velocity (SV), Arbitrary eccentricity (AE), and the impact of PFVs on GP was investigated. The calculation of arbitrary eccentricity was performed for each trial, whereby it was determined as the minimal distance from all observed target eccentricities displayed by the participants throughout the entire trial. We employed statistical tests as a methodological approach for data analysis and for our research findings. Then, feature selection using t-test and classification by SVM method. To introduce the best classifier, the Radial Basis Function (RBF) kernel and squared l2 penalty were employed in various hyperparameters. And Stratified cross-validation with k = 5 to evaluate.

Results : Expectedly, the results demonstrate that the reaction time(RT) to the global level was significantly lower than the local (t=4.71, p=7.12e10-05). Also, when individuals were instructed to the local level, there was a notable increase in the NF(t=5.62, p =6.57e10-6) and the FD (t=-4.204 p = 1.21e10-3). Conversely, these two features decrease when individuals attend on the global level. The AE that was selected subconsciously was significantly different between the local and global tasks (t=-4.03, p = 4.2e10-4), indicating distinct cognitive processing strategies employed for each task. Furthermore, participants exhibited a heightened propensity to focus on the left side of the first visual field when individuals were attended to the global level vs local level (t=-3.60, p = 1.29e10-3). Additionally, Meaningful distinctions were detected in saccade distance when comparing the local and global task conditions(t = 3.93, p = 5.5e10-4). Moreover, substantial variance in saccade velocity was evident, highlighting a significant difference between the local and global tasks (t = 5.19, p = 2.05e10-5). Additionally, SVM with RBF kernel classified different eye movement patterns with 75.8304 percent accuracy and 0.830112 recall and 0.759203 F1 using selected features.

Conclusion : The findings enhance our comprehension of global and local attention dynamics. This study has the potential to advance our ability to detect global and local processing tendencies within different environmental contexts.

Keywords : Global local processing; Global precedence; Eye-movement; Navon Task

Count: 84
Abstract ID: 567
subject: Cognition: Other
Presentation Type: Poster

Persistent effects of early handling on motor activity and social interaction after social stress in adolescence: morphological alterations of striatal neurons

Submission Author: Negar Kayedi-Bakhtiari

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Background and Aim : Early-life stress is critical as it occurs during a period of rapid brain development and high biological plasticity. Chronic stress during this time can lead to anxiety and depression; however, it can also result in increased resistance to stress. The striatum, in addition to its role in movement, plays a crucial role in cognitive functions such as social interactions. This study aimed to investigate the impact of early handling on the morphology of striatal neurons and explore its potential relationship with the behavioral response to social defeat stress.

Methods : Newly born male Wistar rats were divided into four groups: control, social defeat, early handling, and early handling with social defeat. For early handling pups were separated from their mother for 15 min/day from postnatal day (PND) 1 until PND 21. On PND 56 - 59, male rats were subjected to repeated attacks from a larger resident adult male rat. On PND 60, rats were tested for social interactions and foot printing. Additionally, the structural features of striatal neurons were studied by analyzing Golgi-cox-stained neurons.

Results : Our findings demonstrated that early handled animals exhibited a higher frequency of motor activity and social interactions after social defeat compared to non-handled rats. Furthermore, morphological analysis using the Sholl method revealed a significant increase in the dendritic arbor complexity of striatal neurons in handled rats compared to non-handled rats.

Conclusion : These results suggest that the modulatory effects of early handling on the morphology of striatal neurons may contribute to its ameliorating effect on stress-induced social interaction deficits.

Keywords : Early handling; Dendritic morphology; Motor activity; Social defeat; Social interaction; Striatal neurons

Count: 85
Abstract ID: 659
subject: Cognition: Other
Presentation Type: Poster

The Potential Impact of Discontinuing Endurance Exercise on Cognitive Function and Neuroprotection: Insights from a Rat Study

Submission Author: Elham Zahedi

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Background and Aim : Physical exercise, particularly endurance training, has long been celebrated for its myriad benefits, not only for the body but also for cognitive function. The concept of neuroprotection through exercise has gained substantial attention in recent years, with research suggesting that regular physical activity can contribute to the preservation and enhancement of neurological health. Endurance exercise, characterized by sustained and prolonged efforts, has been linked to improved cardiovascular health, enhanced mood, and cognitive function. This article aims to delve into the specific neuroprotective advantages associated with endurance training and, more importantly, to explore whether discontinuing such exercise might compromise these benefits or potentially exacerbate cognitive conditions. By examining the potential repercussions of ceasing endurance exercise, we seek to contribute valuable insights into the complex interplay between physical activity and cognitive well-being, shedding light on whether the positive effects endure in the absence of consistent training.

Methods : To execute this strategy, 30 male Wistar rats with weights ranging from 100 to 150 grams were randomly allocated into three categories: 1) a control group, 2) an exercise group, and 3) an exercise+rest group. They underwent a 7-day adaptation period under standard light/dark conditions and had unrestricted access to water and food. The exercise protocol involved a two-week preliminary training program (for groups 2 and 3) followed by 10 weeks of intense exercise. Subsequently, group 2 continued the exercises for an additional 4 weeks, whereas the exercises for group 3 were discontinued. Upon completion of the sixteenth week, behavioral assessments were performed on the rats, and ultimately, the rats' brains were extracted for diagnostic experiments.

Results : Data of behavioral test showed a significant increase in NOR memory index in group 2 compared with control groups. Discontinuation of endurance exercises created slightly reduced effects on the behavioral parameters of the NOR test. The rats of group 2 showed significantly decrease of inflammatory factors (TNF-α, IL-6) compared with control group. Exercise cessation can lead to an increase in inflammatory factors compare to the other two groups.

Conclusion : Based on the findings of our study, discontinuation of endurance training leads to a reduction in the preventive effects of exercise on inflammatory and behavioral indices. Therefore, discontinuation of endurance exercises can lead to an increased likelihood of cognitive impairments.

Keywords : Endurance Exercise, Cognitive Function, Neuroprotection

Count: 86
Abstract ID: 586
subject: Cognition: Other
Presentation Type: Poster

Correlation between Cognitive Index and Lipoproteins in security guards

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Background and Aim : Recent evidence indicates a link between lipoprotein levels and cognitive health. Studying this connection through individuals' cognitive index offers valuable insights into potential impacts on their cognitive performance. Cognitive health is essential for various occupations, with specific jobs requiring different cognitive indexes. For example, a job like security guard necessitates good cognitive indexes such as memory and attention. Therefore, this study aims to explore the relationship between total cholesterol (TC), HDL, LDL, and triglycerides (TG) with the most important qEEG-based cognitive indexes in young and middle-aged security guards.

Methods : This cross-sectional study involved 123 healthy security guards aged 20-60 years. Lipid profiles, including TC, LDL, HDL, and TG levels, were measured through complete blood count. Additionally, plasma lipoprotein levels were grouped into four equal classes for a more detailed evaluation. Cognitive indicators of attention, memory, salience, language, mood, and executive function were examined using a brain map (qEEG recording). Spearman correlation analysis was conducted separately for lipoproteins in general and quartiles, as well as for young and middle-aged security guards, with reported p-values and correlation coefficients.

Results : There is a significant relationship between TC and executive function (r=-0.2944, p=0.0202). After adjusting for age, TC showed a significant relationship with attention (r=-0.4338, p=0.0187) and executive function (r=-0.5475, p=0.0368) in middle-aged security guards. Additionally, the first quartile of TC showed a significant relationship with memory (r = -0.2785,

p = 0.0415), the second quartile with mood (r = 0.4369, p = 0.0124), and the third quartile with attention (r = -0.3823, p = 0.0491). As for triglyceride (TG) levels, only the third quartile (r = -0.3919, p = 0.0150) had a significant relationship with mood. LDL was related to executive functions (r = -0.3687, p = 0.0032) and also to attention (r=-0.3909, p=0.0360) and executive function (r=-0.6709, p=0.0077) in middle-aged individuals. Regarding HDL levels, a significant correlation was found with attention (r = -0.1987, p = 0.0296). Interestingly, the second quartile showed a relationship with attention (r = 0.4500, p = 0.0009) and language (r = 0.4398, p = 0.0118), while the third quartile was related to executive functions (r = -0.6825, p = 0.0175) and language (r = -0.6237, p = 0.0334).

Conclusion : Research suggests that in security guards, higher levels of TC are associated with lower scores in executive function, memory, and attention. TG was only linked to mood scores in the third quartile. There is a clear correlation between high IDL and low scores in executive function. The most significant relationships were found between HDL and cognitive indexes. HDL was inversely correlated with attention and language, and directly correlated with attention, language, and executive function in different quartiles. Additionally, in middle-aged individuals, TC and LDL are generally linked to lower scores in attention and executive function.

Keywords : Lipoprotein; cholesterol; triglyceride; cognitive index; security guard

Count: 87
Abstract ID: 487
subject: Cognition: Other
Presentation Type: Poster

Which one is more Appetizing? Blue or Red: An eye tracking study

Submission Author: Fatemeh Sadeghi

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Background and Aim : Defined as an intense desire or urge to eat a specific food, craving contributes to the increased eating and weight gain. While studies have explored various physical and psychological triggers impacting craving, limited research has delved into the impact of environmental design features on food cravings in adults using physiological indicators. This study aims to identify what architectural features could elicit a strong craving for an appetitive food.
Methods : Thirty healthy adult (average= 30.03± 6/85 years) were exposed to random images of a slice of a chocolate cake. manipulating variables such as light, color, and layout geometry. After viewing each image, participants were asked to rate their level of craving on a five-point Likert scale, and concurrent monitoring of pupil diameters was conducted. Assessments included the Depression, Anxiety, and Stress Scales-21 (DASS-21), the Positive and Negative Affect Scale (PANAS), and the Food Cravings Questionnaire-State (FCQ-S) scale.
Results : Repeated measures ANOVA on the pupil size revealed heightened food cravings when participants observed the blue color, correlating with an increase in pupil diameter compared to other colors ($p < 0.001$). One-sample t-tests in self-report assessment and eye tracking demonstrated that the light could significantly increase food cravings ($p<0.001$), while no significant effects were observed regarding spatial geometry.
Conclusion : The eye-tracking results of the study highlight a noteworthy association between the color blue and increased food cravings, suggesting that the color of the surrounding environment can influence food cravings. The implications of this research extend to practical applications, providing valuable insights for designers and architects designing dining halls for diverse populations, including the elderly and students, as well as restaurant design to manage food cravings with a health design approach. Future research should explore additional measurement tools to deepen our understanding of these intriguing findings.
Keywords : Food cravings, Light, Color, Layout geometry

Count: 88
Abstract ID: 488
subject: Cognition: Other
Presentation Type: Oral

How does RDoC define mental disorders in comparison with DSM? (Presenting some clinical samples) part II

Submission Author: Mohammad Ghadirivasfi

Atefeh Arvin[1], Mohammad Ghadirivasfi[2]

1. Resident of psychiatry, Iran University of Medical Sciences, Tehran, Iran.
2. Research Center for Addiction and Risky Behaviors (ReCARB), Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : -Since 2009, the Research Domain Index or RDOC was established in NIMH, which is a research framework for examining mental disorders, which initially defined research on molecular, genetic, cellular and neural networks in five domains. A promising perspective for etiology, prevention, diagnosis and treatment, not based on traditional classification, which is based on laboratory and imaging, like the science of diseases in medicine, the nature of diseases is identified and special treatments are explained on it.

Methods : -In recent years, five domains were expanded to six domains. In other words, the brain was classified into six functional and structural areas, which can lead to psychiatric disorders. RDoC “domains” of human functioning and behavior are classified to negative and positive valences, cognitive systems, systems for social processes, arousal/regulatory systems, and sensorimotor systems. For example, sleep is associated with arousal domain, anxiety and fear with negative valences domain, attention deficit or memory with cognitive systems domain, movement symptoms in catatonia or conversion with sensorimotor domain, substance use with negative and positive valences domain, autism with social processes domain.

Results : -In contrast with DSM which classifies different non-specific signs and symptoms in orders and defines disorders including Major depressive disorder, when considering RDoC, each sign and symptoms is introduced by its neural network in each domain and ascertains the proportion of each sign or symptoms with others.

Conclusion : With what was described, Substance use disorder or Mood disorders defines with modern perspective, its psychopathology and treatment. In addition, it is promising that prevention methods would be provided in next years by detecting specific biomarker or biomarkers for any psychiatric disease.

Keywords : RDoC, psychiatry, biomarker

Count: 89
Abstract ID: 437
subject: Cognition: Other
Presentation Type: Oral

How does RDoC define mental disorders in comparison with DSM? (Presenting some clinical samples) part I

Submission Author: Mohammad Ghadirivasfi

Mohammad Ghadirivasfi[1], Atefeh Arvin[2]

1. Research Center for Addiction and Risky Behaviors (ReCARB), Iran University of Medical Sciences, Tehran, Iran.
2. Resident of psychiatry, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Since 2009, the Research Domain Index or RDOC was established in NIMH, which is a research framework for examining mental disorders, which initially defined research on molecular, genetic, cellular and neural networks in five domains. A promising perspective for etiology, prevention, diagnosis and treatment, not based on traditional classification, which is based on laboratory and imaging, like the science of diseases in medicine, the nature of diseases is identified and special treatments are explained on it.

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Conclusion : With what was described, Substance use disorder or Mood disorders defines with modern perspective, its psychopathology and treatment. In addition, it is promising that prevention methods would be provided in next years by detecting specific biomarker or biomarkers for any psychiatric disease

Keywords : RDoC, psychiatry, biomarker

Count: 90
Abstract ID: 302
subject: Cognition: Other
Presentation Type: Oral

Context-specific and context-invariant computations of interval timing

Submission Author: Ahmad Pourmohammadi

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Background and Aim : An accurate sense of time is crucial in flexible sensorimotor control and other cognitive functions. However, it remains unknown how multiple timing computations in different contexts interact to shape our behavior.

Methods : We asked 41 healthy human subjects to perform timing tasks that differed in the sensorimotor domain (sensory timing vs. motor timing) and effector (hand vs. saccadic eye movement). To understand how these different behavioral contexts contribute to timing behavior, we applied a three-stage Bayesian model to behavioral data.

Results : Our results demonstrate that the Bayesian model for each effector could not describe bias in the other effector. Similarly, in each task the model-predicted data could not describe bias in the other task. These findings suggest that the measurement stage of interval timing is context-specific in the sensorimotor and effector domains. We also showed that temporal precision is context-invariant in the effector domain, unlike temporal accuracy.

Conclusion : This combination of context-specific and context-invariant computations across sensorimotor and effector domains suggests overlapping and distributed computations as the underlying mechanism of timing in different contexts.

Keywords : Bayesian inference; explicit timing; interval timing; motor timing; sensory timing

Count: 91
Abstract ID: 430
subject: Cognition: Other
Presentation Type: Poster

Predicting inhibition through connectivity between left and right dorsolateral prefrontal cortex (DLPFC)

Submission Author: Parisa Rahnamayelashkami

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Background and Aim : Inhibition is one of the main components of executive functions and plays an important role in daily life, therefore identifying factors that can predict inhibition is of particular importance. Considering the major relationship between frontal areas in inhibition, the purpose of this study was to investigate the relationship between the left dorsolateral prefrontal cortex and the right dorsolateral prefrontal cortex with inhibition in the employees of one of the consulting institutes in Tehran.

Methods : The research was correlational. The statistical population of the research included 300 employees of one of the consulting institutes located in Tehran in 1401, from which 60 people were selected by purposeful sampling. The computer version of the go/no go test was used to collect data, and Mitsar EEG-202 hardware and Win-EEG software were used to record brain waves.

Results : The results of the research showed that there is a positive and significant relationship between the coherence of the left and right dorsolateral prefrontal cortex in theta and alpha frequency bands with inhibition($p<0/05$). Coherence of left and right dorsolateral prefrontal cortex in theta frequency band could significantly predict 7% of inhibition changes($p<0/05$).

Conclusion : According to the findings of the present study, the role of the connections of a certain area of the prefrontal cortex in the prediction of inhibition was identified. The findings of the research indicate that the role of neurological markers should be given enough attention in the evaluation of people's inhibition.

Keywords : inhibition; left dorsolateral prefrontal; right dorsolateral prefrontal.

Count: 92
Abstract ID: 377
subject: Cognition: Other
Presentation Type: Poster

The Dynamic Link: Exploring Emotions and Pupil Size Variations

Submission Author: Helia Taghavi

Helia Taghavi[1], Leila Sharbaf[2], Fatemeh Esmailzad[3], Abdol-hossein Vahabie[4], Javad Hatami[5], Ehsan Rezayat[6]

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Background and Aim : Emotions have evolved to fulfill our need to communicate quickly and efficiently, and emotional processing plays a fundamental role in human interactions. Like other cognitive processes, emotional processing can be divided into conscious and unconscious processes, and studies have shown that there are many quantitative and qualitative differences between these two types of processing. After influential research by Hess and Polt (1960), pupillometry has gained prominence as a tool to investigate differences in conscious and unconscious emotional processing.

Methods : In this study, there were two blocks of conscious and unconscious emotion perception tasks. In the conscious block, emotional facial expressions were presented for 1000 ms, and in the unconscious block, emotional facial expressions were presented for 50 ms and then were masked by the neutral expression of the same identity. Throughout each trial, the pupil size and gaze direction of the participants were monitored by an eye tracker device, and participant's responses were collected via Forced-choice classification.

Results : Observing the trend of pupil size changes as a criterion of emotional processing showed that all emotions elicit more significant changes in pupil size during unconscious perception than conscious perception. Additionally, there appears to be a difference in pupil dilation for different emotions, and the rise time for each emotion varies. Using the Pupil Response Estimation Toolbox, the pupil response function (PuRF) was fit for each participant.

Conclusion : There are different brain networks for conscious and unconscious emotional processing. In line with the literature, a more prominent change in pupil size during the unconscious emotional presentation confirms the role of subcortical structures in the unconscious processing of emotions.

Keywords : Emotional processing, Unconscious emotion perception, Pupillometry, Pupil response function

Count: 93
Abstract ID: 565
subject: Cognition: Other
Presentation Type: Poster

The Neural Correlates of Cardiovascular Disease: A Neurocognitive Perspective

Submission Author: Somaye Naghavi

Somaye Naghavi[1], Fariborz Dortaj[2], Fatemeh Ghaemi[3], Mojtaba Salarifar[4]

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Background and Aim : -Cardiovascular disease (CVD) has long been recognized as a leading cause of morbidity and mortality worldwide. While its etiology has primarily been attributed to traditional risk factors such as hypertension, hyperlipidemia, and diabetes, emerging research has shed light on the intricate interplay between cardiovascular health and neurocognitive function. This review aims to delve into the neurocognitive basis of cardiovascular disease, exploring how cognitive factors, brain health, and neural pathways contribute to the development, progression, and outcomes of CVD.

Methods : -A comprehensive systematic review was conducted, involving the analysis of studies published in the past two decades, utilizing databases including PubMed, MEDLINE, and Web of Science. Keywords such as "neurocognition," "cardiovascular disease," "cognitive impairment," and "neurovascular pathways" were employed to identify relevant articles. Eligible studies were meticulously analyzed to provide a comprehensive understanding of the topic

Results : - The review uncovers a complex relationship between neurocognitive function and cardiovascular disease. Cognitive impairment, such as deficits in memory, attention, and executive function, has been identified as both a risk factor for and a consequence of CVD. Factors such as chronic stress, depression, and anxiety have been shown to contribute to cognitive dysfunction while also exacerbating CVD. Additionally, shared pathophysiological mechanisms, including inflammation, oxidative stress, and endothelial dysfunction, have been identified as links between

neurocognitive decline and CVD. Moreover, neurovascular pathways, involving interactions between the brain, autonomic nervous system, and vascular system, play a crucial role in the development of CVD and its complications.

Conclusion : The findings underscore the need for a holistic approach to the prevention and management of cardiovascular disease. Acknowledging the neurocognitive basis of CVD opens new avenues for early detection and intervention. Incorporating cognitive assessment into cardiovascular risk stratification may help identify individuals at higher risk. Additionally, addressing psychological and emotional well-being as part of CVD management could improve overall outcomes. Understanding the neurovascular pathways and shared pathophysiological mechanisms offers potential therapeutic targets for CVD, beyond traditional risk factor management.

Keywords : Neurocognition, cardiovascular disease, cognitive impairment, neurovascular pathways, inflammation, risk factors.

Count: 94
Abstract ID: 203
subject: Cognition: Other
Presentation Type: Oral

Eye Movements During Sentence Processing in High-Functioning Autistic Children Compared to Neurotypical Peers: an eye tracking study

Submission Author: Faezeh Dehghan

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Background and Aim : Autism spectrum disorder (ASD) is a neurodevelopmental disorder. The pattern of eye movements during reading can significantly impact reading quality. This study aimed to examine the eye movement patterns, which are essential for reading, in children with ASD as compared to their neurotypical peers.

Methods : This study focused on two crucial indicators that influence reading: eye fixation time and saccade movement. Comparison of parameters of saccade movements and eye fixation in a sentence reading task was done between two groups using an eye tracker device. autistic chidren (15 children, average age: 102.33months) and their neurotypical peers (17 children, average age: 101.69 months) participated in this study.

Results : Results: The results showed that compared to their neurotypical peers, children with ASD have lower amplitude while reading sentences (P.Value: 0.02(.These children used more number of fixations to read the words in the sentence (P.Value: 0.02(. Comparing the total time

spent to read a sentence between the two groups shows that autistic children need more time to read a sentence (P.Value: 0.02(.

Conclusion : Discussion: these results suggest that low-level sensorimotor processes involved in generating accurate eye movements such as dorsal visual pathway and cerebellum can significantly impact the reading quality of children with ASD.

Keywords : High-Functioning Autism, Eye Tracking, Reading, Eye Movements, saccadic eye movements, sensory motor integration

Count: 95
Abstract ID: 296
subject: Cognition: Other
Presentation Type: Poster

Involvement of control networks deficits in stuttering

Submission Author: Elahe Khodayari

Elahe Khodayari[1], Amir Hossein Ghaderi[2]

1. forein Language department of Allameh Tabatabai university
2. department of psychology and educational science, university of Isfahan

Background and Aim : Stuttering is a developmental speech fluency disorder (Craig et al., 2002) characterized by spontaneous sound prolongations, speech blocks, and syllabic repetitions occurring at the onset of words and sentences in individuals who stutter (IWS). From a neural perspective, multiple investigations have proposed various mechanisms associated with stuttering, encompassing abnormal neural activities within the motor cortex, auditory cortex, and frontal regions. These diverse cortical areas collectively raise the hypothesis that stuttering involves a broad cortico-cortical network (Ghaderi et al., 2018). This hypothesis has been substantiated by prior electroencephalography (EEG) studies that have revealed deficits in functional connectivity (Joos et al., 2014) and whole-brain network topology (Ghaderi et al., 2018). However, no studies have explored the modular activity of functional subnetworks in stuttering.

Methods : In our investigation, we enrolled 17 participants with stuttering (IWS) and 18 age-matched individuals without a history of speech impairments in the control group. We recorded five-minute EEG data during a resting state with open eyes, and after preprocessing, we conducted source localization using the sLORETA algorithm. Subsequently, lagged coherence was computed between 84 Brodmann areas. Employing graph theoretical analysis, we calculated the modularity of three control networks (default mode network, dorsal attention network, and salience network) as well as the auditory, visual network, and sensorimotor network within four EEG frequency bands: theta (4–8 Hz), alpha (8–12 Hz), beta1 (12–20 Hz), and beta2 (20–30 Hz).

Results : Our findings demonstrated significant differences between the two groups in the modularity of the default mode, dorsal attention, auditory, and sensorimotor networks within the theta and alpha bands.

Conclusion : These results suggest that although stuttering is associated with early sensory-motor processing in the brain, higher-level control networks may also be implicated in stuttering.

Keywords : stuttering; control network; sensory networks; EEG; source localization

Count: 96
Abstract ID: 51
subject: Cognition: Other
Presentation Type: Poster

Investigating the effectiveness of temptation management training based on the cognitive-behavioral approach in controlling cravings in women addicts undergoing treatment

Submission Author: Narges Hedayati

Narges Hedayati[1]

1. Expert of Fars Welfare Organization

Background and Aim : Psychological interventions can be effective in improving the quality of life of drug addicts, in this regard, the present research was conducted with the aim of investigating the role of one of these interventions, namely the cognitive-behavioral approach, on the self-esteem and self-control of addicted womenundergoing treatment.

Methods : The present research was carried out in the form of a pre-test and post-test, and 20 people were selected as a sample of the research using the "accessible sampling" method, from among the addicted women who referred to the center of self-care in Shiraz, and in two groups of 10 people, the test and 12 training sessions were held for the experimental group based on the cognitive-behavioral approach. So the test was taken. After collecting data, univariate analysis of covariance was used for their statistical analysis.

Results : The results showed that the cognitive-behavioral approach increased self-esteem and self-control in the experimental group and found a significant difference in both variables compared to the control group.

Conclusion : According to the confirmation of research hypotheses that show the effectiveness of the cognitive-behavioral approach and its positive effect on the strengthening of self-esteem and self-control in addicted women under treatment, we conclude that the use of this psychological approach is effective in improving the mental conditions of addicts who are quitting, so its use It is recommended in other addiction treatment centers, and this research can be used as a model for further research byother researchers.

Keywords : Temptation management, Cognitive-Behavioral approach, Craving, addicted women under treatment.

Count: 97
Abstract ID: 101
subject: Cognition: Other
Presentation Type: Poster

Investigating resting-state brain networks, during breathing of inert air and air mixed with odor, using MRI

Submission Author: Asra Karami

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Background and Aim : Considering the strong anatomical and functional connections between smells and emotions, and their role in creating behavioral and cognitive changes, much attention has been paid to the flexible olfactory system. Therefore, our goal in this project is to investigate whether pleasant and unpleasant odors can affect the brain's resting state networks.

Methods : Thirty healthy participants (14 male and 16 female) between the ages of 19 and 35 (M = 22.96) were recruited for the study. To ensure the health of people's olfactory systems, the Sniffin' Sticks test kit was performed for all the subjects. Subjects performed the resting state fMRI experiment (while no task was performed). Imaging was done with two runs; for each run, four odor conditions were considered. Odor conditions include no odor, pleasant odor, air, and unpleasant odor, respectively. Then, to investigate connectivity between olfactory and resting state networks, 11 ROIs were considered. Finally, SPM, FSL, and CONN imaging processing applications were used to analyze the data.

Results : According to the results obtained from the SCA and ROI-to-ROI analysis, in presenting pleasant odors, the areas related to the resting state network, including the anterior cingulate cortex, inferior parietal lobule, bilateral medial prefrontal cortex, superior parietal lobule, and the areas related to olfactory, including the orbitofrontal and piriform cortex, were activated. Our results showed activation of resting state areas including the precuneus cortex, medial prefrontal cortex, and anterior cingulate cortex during air presentation. In addition, the amygdala, precuneus, and

piriform regions were activated in connection with the uncus, presenting unpleasant odors. The results of the ICA analysis revealed other active areas for us. Although these areas were not among the areas we considered, the activation of a number of other areas related to the resting and olfactory network showed us in the conditions of pleasant and unpleasant odors

Conclusion : According to the obtained results, pleasant, unpleasant, and air can cause changes in the pattern of regions related to the resting state networks when compared to no odor conditions. But the activity pattern created is completely different. Overall, our study revealed a novel approach to the influence of pleasant and unpleasant odors and air on regions related to the DMN, ECN, and the Salience Network. This study shows a close relationship between the processing of different odors with resting-state networks, since resting-state networks can show significant differences in neurological diseases. Therefore, the results of this study can be used in preclinical and clinical studies.

Keywords : olfactory, resting-state networks, Functional connectivity, fMRI

Count: 98
Abstract ID: 121
subject: Cognition: Other
Presentation Type: Oral

Exploring the Predictive Power of TMS-EEG in Cognitive Abilities: A Correlation Analysis with Three Cognitive Tasks

Submission Author: Mojtaba Chizari

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Background and Aim : TMS-EEG is a tool that can be used to evaluate the inhibitory and excitatory mechanisms of the brain. On the other hand, we know that our cognitive abilities depend on the insight provided by inhibitory and excitatory mechanisms of neurons. Therefore, TMS-EEG is a valuable tool that can shed light on the relationship between inhibitory and excitatory mechanisms and our cognitive abilities. We aim to evaluate the relationship between inhibitory and excitatory mechanisms and cognitive abilities (attention, working memory, and decision-making) using TMS-EEG and cognitive tasks.

Methods : Twenty participants took part in a TMS-EEG experiment and completed three tasks (Stroop, N-back, and Iowa) on two different days. The correlation between the TMS-EEG results and task performance was analyzed for each participant.

Results : The results have shown that the peak and latency of components in TMS-EEG vary according to the performance of participants in cognitive tasks.

Conclusion : Our study has revealed a significant correlation between TMS-EEG results and participants' cognitive abilities. This suggests that TMS-EEG has the potential to predict cognitive performance, specifically in the domains of attention, working memory, and decision-making. These findings highlight the valuable role of TMS-EEG in understanding the relationship between inhibitory and excitatory mechanisms and cognitive abilities, offering insights into the neural basis of human cognition.

Keywords : TMS-EEG; Cognitive Abilities; inhibitory and excitatory mechanisms

Count: 99
Abstract ID: 454
subject: Cognition: Other
Presentation Type: Poster

Improving Prosocial Choice Behavior by Environmental Enrichment and Intranasal Oxytocin Administration in an animal model of Early-life Stress

Submission Author: Sara Joushi

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Background and Aim : Early-life experiences, including parental care, affect cognitive and behavioral performance in later stages of life. Early-life adversity is one of the prevalent issues in today's society that increase vulnerability to neuropsychiatric disorders. Maternal separation (MS), an established animal model of early-life stress, is known to induce permanent changes in the central nervous system and is associated with increased levels of anxiety and cognitive impairments. Previous studies have been demonstrated that MS may lead to impairments of social behaviors. Here, we investigated the effects of MS on mutual reward preferences in a double T-maze prosocial choice task. Since enriched environment (EE) and intranasal oxytocin (OT) administration have beneficial effects on cognition and social behaviors, in the present study we tested whether these treatments, alone or in combination, would affect prosocial behavior of rats which underwent MS during infancy.

Methods : Rat pups underwent MS protocol for 180 min/day from postnatal day (PND) 1–21. From PND 22–34, rats were exposed to an EE and/or received intranasal OT (2 µg/µl, 7 days). Hence, the groups consist of Control (CTRL), MS, the treatment groups (CTRL+EE, CTRL+OT, MS+EE, MS+OT, CTRL+EE+OT and MS+EE+OT) and the OT vehicle groups (CTRL.Saline and MS. Saline groups). Assessment of prosocial choice behavior was started in adolescence.

Results : MS impaired prosocial choice behavior and reduced mutual reward preferences. Getting exposed to EE and intranasal OT administration could overcome MS-induced deficits and promoted mutual reward preferences of MS rats. EE and OT may have synergistic effects on promoting social behavior, since combination of the two treatments strengthened mutual reward preferences.

Conclusion : Obtained results demonstrated that EE and OT may be considered as profitable therapeutic approaches for promoting some aspects of social behavior.

Keywords : Prosocial choice behavior: Maternal separation: Oxytocin: Enriched environment: Early-life stress: Social interaction

Count: 100
Abstract ID: 453
subject: Cognition: Other
Presentation Type: Poster

Foot mental rotation ability and walking in multiple sclerosis patients with mild disability

Submission Author: Mahdieh Azin

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Background and Aim : Multiple sclerosis (MS) is an inflammatory demyelinating disease of the central nervous system that leads to movement problems and cognitive disorders in patients via axonal injury. Foot mental rotation is a cognitive function that is impaired in various neurological diseases. In this study, we investigated that was the foot mental rotation impaired in Relapsing-remitting MS (RRMS) patients with mild disabilities compared to healthy individuals? And whether was the foot mental rotation associated with gait disturbance in the Timed 25-Foot Walk (T25-FW) test as well as with the cognitive disfunction in the paced auditory serial addition test (PASAT) in RRMs patients?

Methods : 37 RRMs patients and 40 healthy individuals who were homogeneous in terms of age, sex and education were included in the study. First, walking was assessed with T25-FW, then the ability of foot mental rotation ability was assessed, and finally information processing speed was assessed with PASAT. Variables between the two groups were assessed independent t-test in SPSS 21 software and p-value <0.05 was considered significant.

Results : The results showed that the reaction time to the foot stimulus increased in RRMS patients compared to healthy individuals (P<0.001). But there was no significant difference related to accuracy rate of responding to foot stimuli between RRMS patients and healthy subjects (P>0.05).

There was also a positive correlation between walking time and reaction time to foot stimuli in RRMs patients (r=0.304, P=0.007). However, there was no significant correlation between walking time and response accuracy rate in foot mental rotation task (r= 0.090, p-value=0.437). There was a negative correlation between walking time and the number of correct responses in PASAT (r= -0.306, P=0.007).

Conclusion : In overall, our results showed that the foot mental rotation ability, which indicates the stage of movement preparation and planning that is impaired in the early stages of RRMs in patients, should be considered in the treatment of patients. The increase in walking time in these patients was associated with an increase in reaction time to the stimuli in the foot mental rotation task and a decrease in the number of correct answers in the PASAT, which can indicate that the cognitive dimension is disturbed along with the movement dimension. Therefore, attention to cognitive rehabilitation such as mental exercises along with routine treatments should be considered

Keywords : Foot mental rotation, Walking, Multiple Sclerosis, Cognitive function

Count: 101
Abstract ID: 210
subject: Cognition: Other
Presentation Type: Poster

Relationship between theory of mind and emotion regulation in autism spectrum disorders

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Background and Aim : Theory of mind (ToM) refers to the cognitive capacity to understand and attribute mental states, such as beliefs, intentions, and desires, to oneself and others. Emotion regulation (ER) involves the processes by which individuals monitor, evaluate, and modify emotional experiences and expressions. It has been suggested that both abilities might be developmentally related, with theory of mind deficits leading to emotional dysregulation. This study aimed to examine the link between theory of mind (ToM) abilities and ED in children with ASD.

Methods : Participants were 30 children with ASD aged 11–17 years. Emotion regulation skills were quantified by using the Emotion Regulation and Social Skills Questionnaire (ERSSQ). ToM was quantified by three different tasks. Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR) and social communication questionnaire (SCQ) were used for diagnosis of ASD.

Results : A significant correlation was found between the scores of ERSSQ and ToM ($P< 0.03$).

Conclusion : The results of this study provide further support for the relationship between ToM and emotion regulation in individuals with ASD. The findings suggest that individuals with deficits in ToM may struggle with emotion regulation processes, potentially leading to difficulties in managing and expressing emotions effectively. Understanding the interplay between ToM and emotion regulation in ASD is crucial for developing targeted interventions that address both domains simultaneously.

Keywords : Autism, Emotion Regulation, Theory of mind

Count: 102
Abstract ID: 328
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

Nomophobia (no mobile phone phobia) and cognitive disorders among students

Submission Author: Nasrin Abdoli

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Background and Aim : Nowadays, the use of smart phones has become a part of people's daily life. It is one of the most important addictions of the 21st century. This fear of not having access to a mobile phone can cause cognitive disorders (horror or social anxiety and panic...) for the person who experiences it. Now two thirds of the world are connected through mobile devices. 58% of smartphone users cannot stay an hour without checking their phone,45% of smartphone users check their phones in the middle of the night. 71% of smartphone users usually sleep next to their mobile phones. Most children own a mobile phone by the age of seven. However, when the lack of using the smart phone to establish and maintain electronic communication is related to psychological distress, such a behavior may be considered a modern-age phobia, or nomophobia (no mobile phone phobia).
Methods : A total of 537 students (mean age: 25.52 years; 42.3% females) participated in the study. They completed a booklet of self-rating questionnaires covering sociodemographic information and symptoms of nomophobia, depression, anxiety, stress, insomnia, and obsessive–compulsive disorders.
Results : Higher scores for nomophobia were associated with higher scores for depression, anxiety, and stress, but not with scores for insomnia and obsessive–compulsive disorders. The regression model confirmed that symptoms of anxiety predicted nomophobia
Conclusion : The present results support the assumption that nomophobia appears to be a mood disturbance related to stronger associations with symptoms of anxiety and, to a lesser extent, with symptoms of depression and stress. By contrast, nomophobia appeared to be unrelated to insomnia and symptoms of obsessive–compulsive disorders.
Keywords : nomophobia; depression; anxiety; stress; obsessive–compulsive disorders; young adults

Count: 103
Abstract ID: 8
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Oral

The effectiveness of virtual reality-based mindfulness training on reducing the incompatibility of students with specific learning disabilities

Submission Author: Akram Azarnia

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Background and Aim : Specific learning disorder in children is a neurodevelopmental disorder that affects the ability of the brain to receive and process information through the interaction of environmental and hereditary factors. Despite having normal intelligence and due to the lack of biological defects in academic fields (reading, writing and arithmetic), these children have weaker academic performance. In addition to educational problems in social interactions and behavioral adaptation, these children have defects and problems that affect their ability to solve problems and use information in different situations, adapt to the frameworks and rules of the social environment. The present research was conducted with the aim of investigating the effectiveness of mindfulness training based on virtual reality in reducing the incompatibility of students with specific learning disorders
Methods : The research method was semi-experimental with a pre-test, post-test and a two-month follow-up. The statistical population was female students with learning disabilities who referred to learning disability centers in the academic year 1401-1402 in Kermanshah city. Sinha's compatibility questionnaire was administered to the students, and among those who met the criteria for entering the research, 24 students were selected by purposive sampling and randomly placed in two groups of 12 people, experimental and control. The experimental group underwent 10 sessions of mindfulness training based on virtual reality, but the group did not receive the training certificate. One week after the last training session, a post-test was conducted and two months later, a follow-up test was conducted
Results : Data were analyzed using repeated measures analysis of variance. The results showed that mindfulness training reduces students' inconsistency ($P<0.001$) and these effects were stable in the follow-up phase
Conclusion : Since mindfulness training based on virtual reality improves the level of adaptation of these students, this efficient method can be used to reduce the incompatibility of these students
Keywords : Specific learning disorder, mindfulness, virtual reality, incompatibility

Count: 104
Abstract ID: 9
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

Investigating the mediating role of information processing speed in the structural relationships of cognitive emotion regulation with adaptation in students with specific learning disabilities

Submission Author: Akram Azarnia

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Background and Aim : Students with special learning disorder, despite having normal intelligence, proper education and not having biological defects such as visual and hearing defects, show weaker performance in specific fields (mathematics, reading and writing) than other students of the same grade. Compared to their peers, these students have a lower emotional regulation ability and perform poorly in using cognitive strategies, so these children use more negative strategies to regulate their emotions; A defect in the cognitive regulation of emotions causes problems in various functions of a person's life and makes a person vulnerable to the anxiety and stress of everyday life and emotionally affects the level of a person's performance. The speed of information processing affects thinking, listening, speaking and how people react in emotional situations and social interactions, it can make a person adapt to challenges. In this research, the mediating role of information processing speed in the structural relationships of cognitive regulation of emotion with adaptation in students with special characteristics has been investigated.

Methods : In terms of applied purpose, the current research was of the type of correlation studies and the method of analysis was of the type of structural equation modeling. The research population included students with special learning disabilities in Kermanshah city in the academic year 1401-1402 who referred to learning disability centers. Among them, 230 people who met the criteria for entering the research were selected using available sampling. His research tools for data collection included Garnefski's (2006) Cognitive Emotion Regulation Questionnaire, Sinha's Student Adaptability Questionnaire, and the Stroop Test. Data analysis was done by structural equation modeling and using SPSS and AMOS software

Results : The findings showed that cognitive emotion regulation has a direct and significant positive effect on adaptation (P<0.05). Cognitive emotion regulation has an indirect and significant positive effect on the adaptation of students with learning disabilities due to the speed of information processing (P<0.05).

Conclusion : The results of the data analysis showed that the cognitive emotion regulation strategies have an effect on the adaptation of students with learning disabilities through the effect they have on the speed of information processing. In fact, by choosing cognitive regulation strategies, positive emotion has a positive effect on increasing the adaptability of these students through the speed of information processing

Keywords : cognitive regulation of emotion, information processing speed, adaptation, specific learning disorder

Count: 105
Abstract ID: 583
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

The Neural Basis of Chrononutrition

Submission Author: Faezeh Mahdavi

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Background and Aim : Chrononutrition, the emerging field that investigates the relationship between the timing of food intake and health, has gained considerable attention in recent years. This review explores the neural basis of chrononutrition, aiming to unravel the complex interplay between circadian rhythms, brain regions, and dietary patterns. Understanding how the brain processes and responds to food at different times of the day holds profound implications for optimizing nutrition and overall health.
Methods : A comprehensive systematic review was conducted, encompassing studies published between 2000 and 2023, sourced from databases like PubMed, MEDLINE, and Web of Science. Keywords used in the search included "chrononutrition," "circadian rhythms," "neural basis," and "food timing." Eligible studies were meticulously analyzed to provide a comprehensive understanding of the neural mechanisms underlying chrononutrition.
Results : The review uncovers a network of brain regions and neurochemical processes involved in chrononutrition. The suprachiasmatic nucleus (SCN), the master circadian pacemaker, plays a pivotal role in synchronizing the body's metabolic processes with the day-night cycle. Brain regions such as the hypothalamus, reward centers (e.g., the nucleus accumbens), and the prefrontal cortex are implicated in mediating the brain's response to food intake, depending on the time of day. Moreover, circadian clocks present in peripheral organs like the liver and gut interact with the central nervous system to optimize nutrient utilization and energy balance.
Conclusion : Understanding the neural basis of chrononutrition offers a pathway to optimizing dietary patterns and promoting health. The circadian influence on brain regions involved in appetite, metabolism, and food reward provides insights into how timing impacts food choices and nutrient utilization. Tailoring dietary recommendations to align with circadian rhythms may offer potential benefits for weight management, metabolic health, and overall well-being. This knowledge emphasizes the significance of considering not only what we eat but also when we eat in the quest for a healthier lifestyle.
Keywords : Chrononutrition, neural basis, circadian rhythms, food timing, brain regions, health.

Count: 106
Abstract ID: 31
subject: Emotion, Motivation and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

The role of the cancer in making sleep disorders: bench to bedside

Submission Author: MohammadSaleh Safari

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Background and Aim : Sleep disorders, especially insomnia, are very common in all types of cancers, but their prevalence and incidence are not well known. Sleep disorder in cancer occurs for various reasons and is usually diagnosed as a psychiatric disorder. Many evidences have shown that sleep disorder is a symptom in cancer patients. So that cancer disrupts sleep by causing pain, fatigue and depression. This study reviews the relationship between sleep disorders and cancer
Methods : This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords cancer, sleep disorder, insomnia, 87 articles related to inclusion criteria were extracted and then analyzed.
Results : The results indicated that patients with sleep disorders are more susceptible to developing various types of cancer, especially breast cancer. They also identified effect of the relationship between sleep and other common symptoms of cancer, especially fatigue, depression and pain. One of the interesting cases is the suppression of melatonin, which naturally leads to the induction of cancer in the tissues, especially the endocrine glands, and then leads to tumorigenesis by disrupting the homeostasis and sleep rhythm.
Conclusion : Sleep disorders such as insomnia, narcolepsy, OSAS, etc. in cancer patients can be in different conditions. Complications of cancer and its treatment, mental disorders related to cancer can provoke sleep disorders in these patients. Of course, articles emphasize the possibility of a two-way relationship between sleep disorders and cancer, which requires more clinical studies to understand the exact mechanism.
Keywords : Cancer, sleep disorder, insomnia.

Count: 107
Abstract ID: 499
subject: Emotion, Motivation and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Sleep quality in multiple sclerosis: a systematic review and meta-analysis

Submission Author: Afshin Moradi

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Background and Aim : -Sleep quality is individual satisfaction with the sleep experience, which is likened to patients' quality of life. This study aims to investigate the sleep quality in multiple sclerosis (MS) patients in comparison to healthy controls (HCs).

Methods : -Following the PRISMA statement, a systematic search was conducted through PubMed (MEDLINE), Web of Science, Scopus, and Embase online databases and studies which assessed the sleep quality based on the Pittsburgh Sleep Quality Index (PSQI), in MS patients and HCs were included. The risk of bias in the included studies is assessed using the Joanna Briggs Institute (JBI) critical appraisal tools and meta-analysis was conducted using the random effect model by the third version of Comprehensive Meta-Analysis (CMA3).

Results : -Out of 1574 identified records, 13 studies were included. Regarding the PSQI scores, this difference was statistically significant (10 studies; I2:94.61%; Standard difference in means: 1.065 (95%CI: 0.758-1.372; p-value<0.001). MS patients were found to have more prevalence of poor sleep quality (PSQI>5); however, the difference is not statistically significant (4 studies; I2: 87.08%; odds ratio: 2.31 [95% CIs: 0.82-6.35]; p-value: 0.113).

Conclusion : Patients with MS have poorer sleep quality. An especial consideration by clinicians on this regard may lead to a significant improvement in patients' quality of life, due to the great influence of sleep quality in MS-related symptoms. Future well-designed studies are needed to reach a comprehensive conclusion on this topic.

Keywords : sleep; sleep quality; multiple sclerosis; systematic review; meta-analysis.

Count: 108
Abstract ID: 106
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Effect of Escitalopram on long-term plasticity in the hippocampal CA1 area in rats under predictable and unpredictable mild-chronic stress

Submission Author: Vajihe Saedimarghmaleki

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Background and Aim : Chronic stress affects various brain functions such as memory. Chronic stress was indicated affects the long- term potentiation (LTP) as cellular mechanism of plasticity and memory. On the other hand, Escitalopram improve brain functions such as learning and memory. Hence, the present study investigates the effects of Escitalopram on LTP in the hippocampal CA1 area in rats under predictable and unpredictable mild-chronic stress.

Methods : Forty-nine male rats were randomly allocated into seven groups: control (Co), sham(Sh), predictable chronic stress (P-St), Escitalopram(Esc), Escitalopram and predictable chronic stress (Esc-P-St), unpredictable chronic stress (UP-St), Escitalopram and unpredictable chronic stress (Esc-UP-St). Different kinds of stress such as restraint stress, light flashing, sleep deprivation, cage tilting, social isolation stress, cold stress, elevated stress (2h/day for 21 days) were used for inducing of unpredicted stress. Whereas, restraint stress (2h/day for 21 days) was used for inducing of predicted stress. Escitalopram (10 mg/kg/day) was injected intraperitoneal for 21 days. The fEPSP slope, amplitude and area under curve (AUC) (as memory assessments) were evaluated in the pyramidal cells of CA1 area in the dorsal hippocampus.

Results : The fEPSP slope, amplitude, and area under the curve significantly decreased in the both predictable and unpredictable stressed groups compared to the control group. In addition, the slope, amplitude, and AUC of fEPSP significantly enhanced in both predictable and unpredictable chronic stress groups compared to their similar stressed groups (predictable and unpredictable stress groups, respectively).

Conclusion : Overall, the predictable and unpredictable chronic mild stress significantly reduced the long-term plasticity in the Ca1 area of the hippocampus. However, memory impairments were

effectively reversed by Escitalopram (10 mg/kg/day) in both stressed groups especially in unpredictable stress subjects.

Keywords : Escitalopram; memory; LTP; predictable stress; Unpredictable stress.

Count: 109
Abstract ID: 154
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Mild and intense early life stress differentially affect behavioural responses to social defeat in young adult rats and morphology of CA3 pyramidal neurons

Submission Author: Zahra AlizadehEzdini

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Background and Aim : Stressful events in an early postnatal period have critical implications for the individual's life and can increase later risk for psychiatric disorders. Hippocampus is involved in stress response and also plays important roles in emotional processes. We studied the effects of two types of early life stress (ELS) on the later response to social defeat stress and vulnerability to stress-induced emotional disorders. The structural alterations of the CA3 hippocampal pyramidal neurons were also evaluated.

Methods : For early handling (EH) or maternal deprivation (MD), newborn rats were isolated from their mothers for 15min/day or 3h/day on postnatal day (PND) 1-21, respectively. Social defeat (SD) stress consisted of physical and sensory confrontation with an aggressive adult male rat on PND 56-59. On PND 61-65, animals from different groups were subjected to open-field test, elevated plus-maze test and forced swim test, and then their brains were dissected out and processed for Golgi-cox staining.

Results : Social defeat stress in adult rats led to increased anxiety and depressive-like behaviors, as expected. This was accompanied by reductions in dendritic spines and the size of CA3 hippocampal neurons. Early handling ameliorated both behavioral and structural alterations caused by social defeat stress. On the other hand, rats that experienced maternal deprivation (MD-SD) displayed intensified behavioral and structural changes compared to socially defeated rats alone. The MD-SD rats also exhibited significant retraction of apical dendrites and pronounced reduction in dendritic spine density.

Conclusion : These findings suggest that different types of ELS can impact the risk for affective disorders in response to social stress in adulthood. The changes in dendritic structure and spine density in CA3 neurons highlight potential mechanisms underlying the effects of early life stress on the behavioral response to stress in adulthood.

Keywords : Early Life Stress, Social Defeat, Hippocampal CA3 Neurons, Neural structure

Count: 110
Abstract ID: 245
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Effects of chronic social inequality conditions on fear learning and locomotor activity in demonstrator rats

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Background and Aim : Along with the human sense of fairness and justice, responses to inequity have enjoyed a long history of scholarship. Some previous studies suggested that some animals also exhibit an aversion to inequality conditions and show a negative reaction to unequal outcomes (known as inequity aversion). Mammalians also usually show negative responses to witnessing the suffering of their conspecifics. The present study evaluated the effects of chronic social inequality conditions on fear learning and locomotor activity in male rats.

Methods : Forty-two male Wistar rats were divided into six groups: Control, single restraint stress, isolation stress, dyadic equal stress (both rats received restraint stress), and dyadic inequality conditions (freely move/restraint model) groups. In the dyadic equal group, a pair of rats were into separate restrainers in a common cage. Whereas, in the dyadic inequal conditions group, a rat was free-move (as an observer), and another one received restraint stress (as a demonstrator) in a common cage. Stress was induced 2h/day for 21 days. Fear learning and locomotor activity measured by passive avoidance test.

Results : Fear learning occurred significantly in all experimental groups. In addition, locomotor activity was decreased significantly in demonstrators compared to the control and dyadic equal groups. Whereas, the locomotor activity of the demonstrators did not have significant differences

compared to the observers and single stress groups. Moreover, the locomotor activity of the isolation stress group did not show significant differences compared to the control group.

Conclusion : Overall, fear learning was robustly enhanced in demonstrators. In addition, locomotor activity decreased remarkably in demonstrators, observers, and single-stress subjects. It indicated avoidance of aversive stimuli indicator (remembrance of receiving an electrical shock in the dark compartment) was also increased in these subjects. While subjects in equally stressed situations did not show increasing avoidance of aversive indicators. Therefore, chronic social inequality conditions, witnessing conspecific suffering, and suffering from immobilization alone are considerable traumatic events that generate symptoms like post-traumatic stress disorder (PTSD). Because individuals with PTSD frequently avoid places, activities, or things that could remind them of the trauma.

Keywords : Social Inequality Condition, Fear learning, Fear memory, Post-traumatic stress disorder

Count: 111
Abstract ID: 77
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Emotional pain or physical pain: The contribution of hedonics in motor performance of runners

Submission Author: Mahboubeh Ghayournajafabadi

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Background and Aim : Examining of athletes who have maladaptive hedonics including physical or emotional displeasure or pain is very important in sports. Indeed, the aim of this case study was to compare the balance ability of three volleyball athletes in two conditions inducing physical pain or emotional pain

Methods : e designed two kinds of induced pain and assessed balance in these expert athletes in medio-lateral index (MLI), anterior posterior index (API) and overall balance

Results : The results showed that API and overall balance scores have largely increased from baseline to physical or emotional pain condition while MLI score showed different pattern

Conclusion : In total, an athlete under emotional pain condition would experience same disturbance in balance scores as physical pain condition

Keywords : Emotional pain, physical pain, balance, athletes, performance

Count: 112
Abstract ID: 22
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Investigation of the quercetin effects on conditioned fear extinction in PTSD rats

Submission Author: Adele Khodaparast

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Background and Aim : Post Traumatic Disorders (PTSD) is one of the diseases of the nervous system, which is caused by exposure to very severe harmful agents. In these patients, memories of traumatic events are reconsolidated and the process of extinction of traumatic memory in a person is impaired. The destruction of brain neurons (especially in the hippocampus) due to oxidative stress is the main cause of PTSD disease. Quercetin has been identified as a potent oxidative stress reducer. The objective of the present study was evaluation of the quercetin effects on conditioned fear extinction in PTSD affected male rats, especially in matter of its effects on oxidative stress in the hippocampus.

Methods : male rats divided in six groups. The control group that were affected to PTSD and solvent of the quercetin was injected to them. The 2nd, 3rd and 4th groups that were affected to PTSD and received the quercetin with the dosage of 10, 25 and 50 mg/kg body weight, respectively. The 2 last groups were fear conditioned and the quercetin with the dose of 50kg/mg and its solvent were administered to them, respectively. Induction of PTSD was done by the single prolonged stress (SPS) method. The quercetin was injected to the rats immediately after the induction of PTSD. During the 3 consecutive tests, in 3 days, the time of freezing of the rats, was investigated as an indicator of fear conditioned memory. Two hours after the 3rd fear conditioning test, Due to evaluation of anxiety like behaviors and also sensitized fear, elevated plus maze and open field tests were done. After the termination of behavioral tests, the animals were killed and

in order to measurement of glutathione peroxidase (GPX), superoxide dismutase (SOD) and also malondialdehyde (MDA), their hippocampus was brought out

Results : Querctetin with the dose of 50 mg/kg, in comparison to control group, significantly reduced the freezing time of the rats in all of 3 consecutive fear conditioning tests and also significantly increased the times of crossing through Central Square in open field test. In elevated plus maze test, Quercetin with the dose of 10, 25 and 50mg/kg body weight, was incapable of induction of significant effects on anxiety markers in rats. In conclusion, behavioral tests were representative of effectiveness of the quercetin with the dose of 50mg/kg, on behavioral disorders of PTSD affected rats. But, the biochemical studies showed that this dose of quercetin has no significant effect on the levels of MDA, GPX and SOD in the hippocampus of affected animals

Conclusion : 1- Quercetin causes the enhancement of extinction of fear memory, dose-dependently. 2- Quercetin with the dose of 50mg/kg decreases the sensitized fear in the PTSD affected rats. 3- Quercetin has no significant effect on anxiety. 4- Evaluation of oxidative stress indices, 10 days after induction of PTSD and quercetin injections, showed that the quercetin had no significant effect on these indices at this time.

Keywords : Quercetin, Fear Extinction, post-traumatic stress disorder (PTSD), Malondialdehyde, Glutathione peroxidase, superoxide dismutase.

Count: 113
Abstract ID: 167
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

Animal models used in the study of depression: advantages and disadvantages

Submission Author: Hedayat Sahraei

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Background and Aim : -Depression is one of the most important challenges facing health organizations, which has directly involved about 6% of the society. Many efforts are being made to find drugs and methods that can help reduce the effects of depression. Undoubtedly, to confirm the effectiveness of a drug or a non-drug method on depression, animal models play an important role. In this presentation, an attempt has been made to introduce and compare the most important and widely used types of animal models used in the study of depression. It should be mentioned that animal models of depression are based on stress. For this reason, the word stress is used in all depression models.

Methods : -Forced Swimming Test (FST): In this method, the animal is released from a distance of 20 cm into a cylinder with a diameter of 25 to 30 cm and a height of 30 to 45 cm, which is filled up to 25 cm with water at ambient temperature. In the case of rats, there is a phase of adaptation with the environment the day before, but in the case of mice, this phase does not exist and the whole work is done in single day. The recording is done in 6 minutes and the movements of the animal are checked in the last 4 minutes of the 6 minutes. This method is relatively simple and does not require a special or expensive equipment. This the reason in which it is very popular among researchers. Unfortunately, because depression induced by acute stress is questionable in terms of compatibility with depression, in fact, it is only recommended to check some effects of some antidepressants.

Results : -Chronic Social Defeat Stress (CSDS) method: Male and female rat and mice create a privacy for themselves, which prevents any other animals from entering that privacy, and if they enter, they deal severely with the resident animal. For this reason, in this animal model, there are

two groups of intruder and resident animals. Rats in the intruder group are subjected to depression studies and many behavioral symptoms such as anhedonia, reduced food and water intake, as well as cellular and molecular signs such as a decrease in the plasma level of BDNF and a decrease in the volume of the hippocampus is observed. The resident male animals are placed in a cage with a sterile female for a period of several days, then every day for a certain period of time, the female is taken out of the cage and an intruder is placed in its place. As a result, the intruder is exposed to the merciless attack of the resident within a few minutes, and after a few days, they fall into a state of chronic stress and develop depression symptoms.

Conclusion : In conclusion, CSDS method has much more similarities with signs and symptoms of depression.

Keywords : Depression, Stress, FST, CSDS

Count: 114
Abstract ID: 528
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

Protective effects of Spirulina platensis, voluntary exercise and environmental interventions on cognitive functions, BDNF changes and morphological remolding in a preclinical model of stress

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Background and Aim : Chronic exposure to stress during the adolescent period has been demonstrated to impair cognitive functions and the dendritic morphology of pyramidal neurons in the rat hippocampal CA3 area. The present study investigated the combined protective effects of Spirulina platensis (SP), a supplement made from blue-green algae with neuroprotective properties, voluntary exercise (EX) and environmental enrichment (EE) against cognitive deficits, alternations in hippocampal BDNF levels, and abnormal neuronal remodeling in adult female rats induced by exposure to chronic restraint stress during the adolescent period.

Methods : Rats were exposed to restraint stress (2 h/day for 10 days, PND 30–40). Then, the animals were treated with SP (200 mg/kg/day), EX, EE, and the combined treatments (SP + EX and SP + EE) between PND 41 and 55 of age. Following the interventions, spatial learning and memory, passive avoidance performance, hippocampal dendritic morphology, and BDNF levels were assessed.

Results : Results showed that plasma corticosterone levels increased at PND 40 and remained elevated at PND 55 and 70 in the stressed rats. Stressed rats showed deficits in spatial learning and memory and passive avoidance performance, decreased BDNF levels in the hippocampus, and reduced apical dendritic length and branch points of the CA3 pyramidal neurons. These deficits were alleviated by the SP, EX, and EE, and the combined treatments, which were accompanied with a decline in serum corticosterone in stressed animals. Some treatments even enhanced cognitive functions, BDNF levels, and neuroanatomical remodeling in the hippocampus of non-stressed animals.

Conclusion : Our findings provide important evidences that physical activity, exposure to EE, and the SP treatment during the adolescent period can protect against adolescent stress-induced behavioral, biochemical, and neuroanatomical impairments in adulthood.

Keywords : Adolescent stress, BDNF, Cognitive function, Dendritic remodeling, Environmental enrichment, Spirulina

Count: 115
Abstract ID: 205
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Thymol reduces anxiety behavior and increases BDNF expression in the hippocampus of immobilized rats

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Background and Aim : Chronic immobility is a common method used to induce stress in animals, which can have negative effects on the central nervous system and lead to emotional disorders such as anxiety. In a recent study, researchers investigated the potential benefits of thymol, a monoterpene, in reducing anxiety behavior induced by chronic immobility stress, and whether brain-derived neurotrophic factor (BDNF) played a role in this effect.

Methods : The study involved adult male Wistar rats, divided into four groups: Control, Thymol, Stress, and Stress-Thymol. Stress was induced by placing the animals in a restrainer for 2.5 hours every day for 14 consecutive days. During this period, the Thymol group received thymol treatment (10mg/kg) by gavage. Anxiety behavior was measured using an elevated plus maze (EPM), and the expression of BDNF mRNA in the hippocampus was evaluated by real-time PCR.

Results : The results showed that the Stress-Thymol group, which received both thymol treatment and stress induction, entered the open arm of the EPM more frequently and spent more time in this arm compared to the Stress group. Additionally, the expression of BDNF in the hippocampus of the Stress-Thymol group was significantly higher compared to the Stress group.

Conclusion : Overall, this study suggests that thymol could be a potential therapeutic agent for anxiety disorders and that its effect may be mediated by the upregulation of BDNF in the hippocampus.

Keywords : Thymol; Chronic immobility stress; Anxiety; BDNF

Count: 116
Abstract ID: 398
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

investigating the effect of esculetin administration on the reward system of the brain following the induction of conditioning with morphine in male rats

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Background and Aim : Esculetin (Esc) is a natural compound of 6 and 7 dihydroxycoumarin and is a derivative of coumarin that has neuroprotective and antioxidant properties in Alzheimer's disease because it inhibits the precursors of beta amyloid plaques in the hippocampus. Effective disease. Because esculetin can cross the blood-brain barrier and cause a decrease in caspase 3 due to the administration of MPTP (an apoptosis indicator), it can be used in degenerative diseases such as Parkinson's. Dopamine neurons, which are effective in the reward process of the brain, can be affected by Esculetin in such a way that it improves performance in Parkinson's disease, so it can be effective in cognitive diseases, one of which is addiction. Peritoneal esculetin on the course, extinction and relapse to morphine re-administration in morphine-conditioned male rats.

Methods : During the conditioning period, the animals received morphine at a dose of 5 mg/kg of body weight for three days. On the fifth day of the expression phase, they entered the extinction phase and morphine reinstatement. During the extinction period, half an hour before taking the conditioning test, he received different doses of esculetin (5, 10 and 20 mg/kg of body weight) intraperitoneally and reinstatement day after taking a dose of morphine with a dose (dose 1 mg/kg of morphine) and after taking the behavioral conditioning test, the head of the animal was separated under deep anesthesia and the area of the nucleus accumbens was separated according to the Watson-Paxinus atlas and fixed in liquid nitrogen and used for biochemically assay.

Results : Our findings showed that daily intraperitoneally (i.p.) injection of esculetin in doses of 5, 10 and 20 mg/kg caused a significant decrease in the extinction and reinstatement period in compared to the control group ($P<0.001$).). Of course, the effects were more significant in doses of 2 and 4 mg/kg. In the groups treated with esculetin, the level of c-Fos (an indicator of neuronal activity) in the area of the nucleus accumbens was changed, so that the level of c-Fos decreased significantly in a dose-dependent manner ($P<0.001$).

Conclusion : These findings show that esculetin can be effective in the period of extinction and reinstatement of morphine and possibly useful in the formation of the basis of addiction.

Keywords : Esculetin, Conditioning, Reinstatement, Morphine, Reward system

Count: 117
Abstract ID: 556
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

The effect of intracerebroventricular injection of crocin on the period of extinction and reinstatement after conditioning with morphine in male rats

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Background and Aim : Opioids are powerful drugs that override the rewarding function of endogenous opioids. Drug addiction creates a significant disorder in motivational circuits. Craving for drug use is an important clinical problem in drug addicts, which causes them to show drug-seeking behaviors even long after detoxification. Saffron consists of at least four active ingredients, including crocin, crocin, picrocrocin and safranal. Crocin reduces the severity of morphine withdrawal symptoms. Psychological dependence increases substance use behavior, while physical dependence leads to drug tolerance and withdrawal syndrome. The use of saffron extract can improve the side effects caused by morphine in a dose-dependent manner

Methods : In this study, a total of 7 control and experimental groups were used, and the samples were grouped into three categories: sham group, repeated injections and single injection group. Then its behavioral observations were recorded and finally the animal was killed. The brains of the rats were removed and were sent to the laboratory for biochemical and histological assay

Results : Our findings have shown that the daily intracerebroventricular administration of crocin in the extinction period in doses of 10, 20 and 40 µg, and especially the 40 µg dose, has reduced the extinction period in such a way that the extinction days are shortened in a dose-dependent manner, but By injecting a dose of 10 µg, the extinction period was shortened by one day, in the dose of 20 µg, two days and three days were reduced from the extinction period, that is, the animal lost its bias from the CPP chamber 2 and 3 days earlier. By injecting a single effective dose of 40

µg of crocin before the extinction period intracerebroventricular, the period reinstatement has not changed compared to the Post Test. By injecting a single effective dose of 40 µg of crocin before the reinstatement period intracerebroventricularlly, the reinstatement period has changed compared to the Post Test. Daily administration of saline solvent intracerebroventricularlly did not shorten the days of extinction, nor did it reduce the reinstatement phase

Conclusion : As expected, repeated and single dose administration of crocin was able to reduce the reinstatement and extinction days in rats , C-fos level in nucleus accumbens and improved histological changes

Keywords : Morphine؛ Crocin؛ CPP؛ Extinction؛ Rat

Count: 118
Abstract ID: 19
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Oral

Repeated administration of N-acetylcysteine could reduce extinction-responding in the morphine conditioned rats

Submission Author: Seyedeh-Najmeh Katebi

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Background and Aim : Many animal studies and early clinical trials suggested that N-acetylcysteine (NAC) may benefit addiction treatment. The present study tried to evaluate whether chronic administration of systemic NAC during the extinction period could reduce the maintenance of the morphine rewarding properties in the conditioned place preference (CPP) paradigm in the rats.

Methods : Forty-six adult male Wistar rats (190-220 g) were examined with morphine (7 mg/kg; sc) and saline (1 mL/kg; sc) during the 3-day conditioning phase in the CPP paradigm. After the acquisition of morphine CPP, different doses of NAC were daily administered during the extinction period (5, 10, 25, and 50 mg/kg; ip). Conditioning score and locomotor activity were recorded by the video tracking system and Ethovision software after acquisition on the postconditioning day, the extinction period.

Results : Daily NAC administration in high doses (25 and 50 mg/kg; ip) reduced extinction-responding compared with the vehicle-control group during the extinction period.

Conclusion : These are the first data suggesting that NAC's application during the extinction period could attenuate the morphine reward associated behaviors in the rats which adds to the growing appreciation that the NAC may have potential therapeutic use in combating morphine dependence. It can be consistent with the hypothesis of the involvement of the glutamatergic system in the pathophysiology of addiction.

Keywords : N-acetyl cysteine, Morphine, Conditioned Place Preference, Extinction

Count: 119
Abstract ID: 432
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Antidepressant effects of the Echium amoenum Seed Oil on mice with chronic unpredictable mild stress

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Background and Aim : Depression is a serious mental disorder. It is estimated that more than 300 million people in the world suffer from depression. This disease can affect all aspects of life including social disabilities and is associated with health difficulties and suicide. Despite the numerous antidepressants, there are still critical barriers to the treatment of depression such as side effects, the effectiveness, treatment resistance, high cost of antidepressant drugs. In recent years, the consumption of polyunsaturated fatty acids (PUFAs) has been promoted for the improvement of depressive status .The plant sources of PUFAs have been found effective for the treatment of psychological disorders. Unlike many herbal seed oils, Echium seed oil has a high level of several fatty acids, which are the precursors of the main essential omega-3 in the body. So in the present study, we evaluated the effects of the seed oil of Echium amoenum on mice with chronic unpredictable mild stress (CUMS).

Methods : In this study, mice were subjected to several mild stressors on a weekly schedule for 4weeks: deprivation of food and water (24h), exposure to an empty bottle (4h), experiencing reversed light/dark (24h), cage tilting 45°, keeping in the wet cage (2h), physical restraint (2h), and exposing to a foreign object (24h). Then, the animal was randomly divided into 5 groups (n=8 in each), including CUMS, CUMS+ Fluoxetine, CUMS+100, and CUMS+250, Control group did not receive stress or treatment. All treatments were administered orally once a day for 4weeks. During the treatment, CUMS procedure was completely considered. The depression-like behaviors were assessed by sucrose preference test (SPT) and forced swimming (FST).

Results : CUMS significantly reduced the sucrose preference % and immobility time in SPT and FST compared to the control, $p < 0.001$. EO 100 and 250mg/kg change the sucrose preference vs CUMS group $p < 0.001$ and $p < 0.01$, respectively. EO 100 and 250mg/kg as well as standard drug significantly attenuated the immobility time vs CUMS, $p < 0.001$.

Conclusion : Overall, these findings suggest that pretreatment with EO attenuates the CUMS-induced depression-like behaviors. It also implied that Echium seed oil could become a new supplement for the treatment of depression.

Keywords : CUMS, Depression, Echium amoenum, Seed Oil

Count: 120
Abstract ID: 558
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Dextromethorphan, a novel treatment for depression

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Background and Aim : Mood disorders are the leading cause of disability worldwide. The two main categories of mood disorder, major depression, and bipolar disorder, occur in 18% and 2-3% of the general population, respectively. The decrease in productivity of a significant percentage of young members of the society, the non-response of about 30% of patients to treatment, the delay of about 4 to 12 weeks until the start of the effect, and numerous side effects require the invention of new drugs. Dextromethorphan (DXM) is an OTC non-opioid antitussive drug. Previous research proved that DXM can be effective in controlling and treating some neurological and mental diseases through binding to serotonin HT1B/D, noradrenaline, sigma1, acetylcholine, and N-methyl D-aspartate receptors.

Methods : Data were collected from the Scopus, Google Scholar, PubMed, and Cochrane libraries for clinical and subclinical studies published in English between 2006-2023.

Results : Previous preclinical studies have shown that intraperitoneal administration of DXM significantly reduced the immobility times in the force swimming test (FST) and tail suspension test (TST) indicating a decrease in the severity of depression. DXM produced a rapid antidepressant effect in the TST test lasting less than 30 minutes but failed to produce a sustained effect 24 hours after drug administration. Another study showed that DXM produced anxiety-like effects by reducing the time spent on the light side, reducing the number of entries and the latency to enter the light side in the light-dark and open-field tests. In recent clinical studies, DXM/bupropion combination can reduce depressive symptoms with good tolerance. The most common side effects of this co- administration were dizziness, nausea, headache, drowsiness, and dry mouth. The combination of two drugs DXM/Quinidine (DMQ) with a dose of (20/10 mg/kg)

per day also has significant antidepressant effects. The side effects of this combination were mainly nausea and vomiting. Both quinidine and DXM are NMDA antagonists and can be effective in the treatment of bipolar depression. Since its possible mechanism does not depend on the monoaminergic system, it may be suitable for patients who have not responded to other available drugs. Another advantage of DMQ is that, unlike ketamine, it does not require intravenous administration.

Conclusion : In general, DXM administration at 30 mg/kg has been reported to result in acute antidepressant effects in rats. Long-term administration of the drug causes anxiety-like effects, but short-term administration can temporarily improve depression; The results show that the therapeutic window for the antidepressant effect of DXM is small. Combining this drug with other antidepressants and finding their synergistic and agonistic effects, as well as finding effective neural pathways can make dextromethorphan a safe and suitable candidate for the treatment of depression in the future.

Keywords : Dextromethorphan; Depression; (AXS-05) ; DMQ; novel treatment

Count: 121
Abstract ID: 170
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Neurobehavioral effects of methamphetamine and sleep deprivation in adult and adolescent male rats

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Background and Aim : Drug addiction may result in sleep problems. Importantly, sleep deprivation is known as an important risk factor for relapse to drug abuse as sleep deprivation mimics the effects of psychostimulants on dopaminergic system of the brain. Moreover, aging may affect sleep and drug addiction. This study, therefore, set out to assess the effects of sleep deprivation (SD) and methamphetamine (METH) on locomotor activity, anxiety-like behavior, and spatial memory in adult and adolescent rats.
Methods : Adult and adolescent male Wistar rats received a neurotoxic METH regimen (four subcutaneous injections of 6 mg/kg, at 2 h intervals). Five days later, the animals underwent a 48-h SD episode using the multiple platforms method. They were then examined using the open field (OF), elevated plus maze (EPM), and Y-maze tasks.
Results : We found that the control adolescent rats showed more hyperactivity than adult rats as they showed more exploration of the open arms in the EPM task. Regarding the SD animals, the adults showed more risky behavior, whereas the adolescents showed more anxiety-like behavior. Interestingly, METH administration abolished the differences between the adolescent and adult sleep-deprived groups. Finally, we did not observe any differences between the performances of the adult and adolescent rats in the Y-maze task. Indeed, neither SD nor METH regimen affected spatial memory in the animals.
Conclusion : Our findings may indicate that there are complicated relationships between SD and METH-induced locomotion and anxiety-like behavior in an age-dependent manner in need of further investigations.
Keywords : Methamphetamine; sleep deprivation; aging; anxiety; locomotor activity; spatial memory

Count: 122
Abstract ID: 343
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Vitamin B12 improved memory impairment following nicotine withdrawal in adolescent male rats: the role of oxidative stress, inflammatory, BDNF, GFAP, and AChE activity

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Background and Aim : The present study aimed to assess the potential effect of vitamin B12 on cognition impairment caused by nicotine cessation in adolescent male rats.

Methods : Adolescent male rats were categorized into two main groups as vehicle (normal saline, intraperitoneally), and nicotine group in which received nicotine (0.2mg/kg) from 21-42 days of ages and then the nicotine group were divided into three groups as withdrawal (the animals returned to regular diet without treatment), second and third groups received bupropion (20mg/kg), and vitamin B12 at three different doses including 0.5,1, and 1.5 mg/kg as treatments to attenuate nicotine withdrawal symptoms. The last group including normal animals received the highest doses of vitamin B12 just in the nicotine abstinence period to compare the effect of that with vehicle.

Results : In MWM, vitamin B12 and bupropion increased the time spent in the target quadrant that is strongly associated with spatial memory as well as the more time spent with the ORT. Vitamin B12 and bupropion modulated both oxidant/antioxidant and inflammatory/anti-inflammatory balance, alongside inhibitory effect on AChE, and GFAP. However, BDNF and amyloid-B showed insignificant difference as compared to vitamin B12 and bupropion.

Conclusion : Considering the present results and similar related studies, vitamin B12 can be introduced as a strong anti-oxidant, and anti-inflammatory agent by which probably improved memory impairment caused by nicotine addiction accompanied by withdrawal. Further, other mechanisms including activity reduction of AChE, and GFAP should be considered; however, it needs further investigation and larger-scale evidences.

Keywords : Nicotine; Learning and memory impairment; Vitamin B12; Withdrawal

Count: 123
Abstract ID: 513
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Minocycline-loaded niosome plays an important role in improving the autistic-like behaviors

Submission Author: Amirhesam Shahbakhshrazavi

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Background and Aim : A variety of medications with different features have been used so far to treat or alleviate the symptoms of autism disease; however, chronic administration of current drugs has been led to negative effects on the physiology of the body. In recent years, it has been demonstrated that minocycline plays a neuroprotective role in animal models of central nervous system disorders. Minocycline can reduce inflammatory mediators, cytokine expression, and activation of microglia in the brain. These inflammatory events are known as triggers of cognitive and behavioral deficits. In this study, it was attempted to use nanotechnology in order to provide a drug delivery system with a lower dosage and greater efficacy of the drug. Thus, the effect of minocycline-loaded niosomes on the autistic-like behaviors in the animal model was evaluated.

Methods : In this research, 24 neonatal male wistar rats were utilized. The rats were divided into four groups: intact, autism, autism group received minocycline at a dose of 50 mg/kg (i.p.), autism group received minocycline-loaded noisome at a dose of 20 mg/kg (i.p.). To induce the autistic-like model, neonatal rats were deprived of their mothers in postnatal days (PND) 1–9, three hours a day. On PND 21, the neonatal rats were housed in different cages that were completely separated from their mother. Injections were performed for three times per day. Behavioral assessments were conducted two hours after last injection to evaluate anxiety-like, repetitive, and social interaction-related behaviors.

Results : The results demonstrated that minocycline and minocycline-loaded-niosomes improved social interactions ($P<0.05$) in autistic-like rats. Minocycline and minocycline-loaded-niosomes also decreased stereotyped and repetitive behaviors ($P <0.0001$). In addition, the results of data analysis indicated a non-significant reduction in anxiety behaviors in comparison with autism group.

Conclusion : According to the outcomes of the behavioral assessments, it can be stated that minocycline-loaded-niosome group showed the more efficacy on stereotyped behaviors and social interaction compared with minocycline-received group.

Keywords : Autism Spectrum Disorder, Maternal Deprivation Model, Minocycline, Niosome, Social Interaction, Anxiety-like Behavior, Repetitive Behavior

Count: 124
Abstract ID: 570
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Effects of FICZ, as an endogenous ligand of AHR on social defeat-induced depression

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Background and Aim : Depression is a common result of social defeat stress, and various structural changes in different regions of the brain have been observed in association with this condition. While the activity of aryl hydrocarbon receptors was initially recognized in the detoxification process of certain compounds, recent studies have revealed their involvement in cognitive and emotional functions as well. This research investigates the impact of a solitary dose of FICZ, an endogenous ligand of these receptors, on the behavioral responses and structural properties of rats' hippocampus following social defeat stress.

Methods : Male Wistar rats were randomly divided into six groups, including control: social defeated (SD), FICZ treated, FICZ + AHR antagonist (CH223191), SD + FICZ and. SD + FICZ + CH223191. Social defeat was done on postnatal days (PND) 65-68. FICZ (100 µg/kg) and CH223191 (1 mg/kg) were injected intraperitoneally as a single dose on PND 68. On PND 96-97, forced swim test was conducted and on PND 99 animals were sacrificed with the intracranial perfusion technique and their brains were removed, dissected and stained with Cresyl violet of Golgi-Cox to study the volume and cell number in CA1, CA3 and DG region and to study the morphology of CA3 neurons.

Results : FICZ-treated animals showed less immobility time and more swimming time than SD group. This effect was partly inhibited by CH223191. Social defeat reduced the volume and total number of neurons in CA1 and DG and FICZ showed a protective effect against it. FICZ treatment

alone did not alter the apical dendrites of CA3 neurons; however, co-treatment with FICZ and CH223191 resulted in a decrease in average dendrite length. Furthermore, rats treated with FICZ + CH223191 exhibited reduced branching and total length of basal dendrites compared to the FICZ + SD group.

Conclusion : In conclusion, it seems that even a single dose injection of FICZ after the social defeat can show protective effects against stress-induced depression, which is associated with structural alterations in the hippocampus

Keywords : Aryl hydrocarbon receptor, Depression, FICZ, Hippocampus, Social defeat

Count: 125
Abstract ID: 591
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Comparison of cognitive regulation of adaptive and non-adaptive emotion in students with regular sports activities and without sports activities

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Background and Aim : Sports activity in students can play a significant role in improving the mood and regulation of students' emotions; Therefore, the present study was conducted with the aim of comparing the adaptive and non-adaptive cognitive regulation of emotions in students with regular sports activities and without sports activities.

Methods : The research is causal-comparative method. The number of 60 male and female students of the first secondary school (30 students with regular sports activities and 30 students without sports activities) from Ostad Shahryar School of Silvana in Urmia was selected as the research sample using the available sampling method and were completed of cognitive emotion regulation Garnefski and et al Questionnaire (2006). The data was analyzed by multivariate analysis of variance and by SPSS 19 software.

Results : The results showed that there was a significant difference between cognitive regulation of adaptive emotion ($P < 0.01$) and cognitive regulation of non-adaptive emotion ($P < 0.01$); So that in the cognitive regulation of adaptive emotion, the scores of students with regular sports activity were higher and in the cognitive regulation of non-adaptive emotion, the scores of students without sports activity were higher.

Conclusion : According to the obtained results, it can be said that regular sports activity in students can be the basis for more use of adaptive emotion cognitive regulation strategies.

Keywords : Adaptive and Maladaptive Cognitive Regulation of Emotion; Regular Sports Activity; Students

Count: 126
Abstract ID: 632
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

The Effect of Transcranial Direct Current Stimulation on Emotion Perception in Multimodal Content Targeting the Right Dorsolateral Prefrontal Cortex in Two Dimensions: Valence and Arousal

Submission Author: Roya Hasheminejad

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Background and Aim : Emotion perception is a crucial skill for social interaction and well-being, but it can be influenced by various factors, such as the type and modality of the emotional stimuli, the individual characteristics of the perceiver, and the cognitive and neural processes involved in emotion regulation. One of the brain regions that plays a key role in emotion perception and regulation is the dorsolateral prefrontal cortex (dlPFC), which is located in the front lobe. Therefore, manipulating the dlPFC activity could potentially affect the emotion perception and regulation of individuals. To manipulate the dlPFC activity we use transcranial direct current stimulation (tDCS). tDCS can modulate the cortical excitability and plasticity of the targeted brain region, depending on the polarity and intensity of the current. The effects of tDCS on emotion perception in multimodal content are still unclear and inconsistent. Multimodal content refers to the combination of different types of stimuli, such as pictures, faces, words, and sounds, that convey emotional information.

Methods : To conduct this study, we utilize the International Affective Picture System (IAPS) dataset for pictures, the International Affective Digitized Sounds (IADS) dataset for sounds, the Radboud Faces Database (RaFD) for facial stimuli, and a normalized dataset for words. In these tasks, stimuli appear on the screen together using the Self-Assessment Manikin (SAM) scale, which includes 2 rating scales ranging from 1 to 9 assessing the emotional dimensions of valence and arousal. The experiment consists of two sessions: a sham session and a stimuli session. The tDCS stimulation is applied after a 5-minute interval, followed by the commencement of the task. Throughout the study, a total of 24 objects are presented, with each object experiencing both the sham and stimuli phases.

Results : The results of the experiment showed that tDCS had a medium significant effect on the valence dimension of emotion perception, but no significant effect on the arousal dimension. The participants who received tDCS rated the emotional stimuli as more pleasant than the participants who received sham stimulation, regardless of the modality of the stimuli. This suggests that tDCS enhanced the positive emotion perception of the participants by increasing the dlPFC activity and reducing the amygdala activity. However, tDCS did not affect the arousal ratings of the emotional stimuli, which indicates that tDCS did not influence the intensity or activation of the emotional stimuli. This could be due to the fact that arousal is more dependent on other factors. The results of this experiment support the hypothesis that tDCS can enhance the emotion perception of the participants, especially for the stimuli that have high arousal and low valence, such as fear and anger.

Conclusion : This thesis contributes to the understanding of the neural mechanisms and applications of tDCS in emotion research. The findings from this research have the potential to contribute to the growing body of knowledge in the field of neuromodulation and emotion perception, offering valuable insights for future studies and applications in related fields, such as psychology, neuroscience, education, and health.

Keywords : Emotion perception; tDCS; Multimodal

Count: 127
Abstract ID: 427
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Anandamide attenuates neurobehavioral deficits and EEG irregularities in the chronic sleep deprivation rats: The role of oxidative stress and neuroinflammation

Submission Author: Rafie Belali

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Background and Aim : Sleep deprivation increases stress, anxiety, and depression by altering the endocannabinoid system's function. In the present study, we aimed to investigate the anti-anxiety and anti-depressant effects of the endocannabinoid anandamide (AEA) in the chronic sleep deprivation (SD) model in rats.

Methods : Adult male Wistar rats (200–250 g) were randomly divided into three groups: control + vehicle (Control), chronic sleep deprivation + vehicle (SD), and chronic sleep deprivation + 20 mg/kg AEA (SD + A). The rats were kept in a sleep deprivation device for 18 hours (7 a.m. to 1 a.m.) daily for 21 days. Open-field (OFT), elevated plus maze (EPM), and forced swimming tests (FST) were used to assess anxiety and depression-like behavior. As well as the cortical EEG, CB1R mRNA expression, TNF-α, IL-6, IL-4 levels, and antioxidant activity in the brain were examined following SD induction.

Results : AEA administration significantly increased the time spent ($p<0.01$), the distance traveled in the central zone ($p<0.001$), and the number of climbing ($p<0.05$) in the OFT; it also increased the duration and number of entries into the open arms ($p<0.01$ and $p<0.05$ respectively), and did not reduce immobility time in the FST ($p>0.05$), AEA increased CB1R mRNA expression in the anterior and medial parts of the brain ($p<0.01$), and IL-4 levels ($p<0.05$). AEA also reduced IL-6 and TNF-? ($p<0.05$) and modulated cortical EEG.

Conclusion : AEA induced anxiolytic-like effects but not anti-depressant effects in the SD model in rats by modulating CB1R mRNA expression, cortical EEG, and inflammatory response.

Keywords : Sleep deprivation; Anxiety; Depression; Cortical EEG; Anandamide; Endocannabinoid.

Count: 128
Abstract ID: 485
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Predicting Substance Use Tendency Based on Self-Transcendence, Mentalization, and Experiential Avoidance among University Students

Submission Author: Parinaz Aghajani

Parinaz Aghajani[1]

1. Parinaz Aghajani

Background and Aim : Addiction is a chronic disease that is characterized by impairment in personal, physiological, and social functioning. This study aimed to predict substance use tendency based on self-transcendence, mentalization, and experiential avoidance among university students. The statistical population of the study included all students of the Islamic Azad University of Khorasgan in the academic year 2023, from which 389 individuals were randomly selected. To collect data, the Levonson et al (2005) self-transcendence, Fonagy et al (2016) mentalization, and Bond et al (2011) experiential avoidance questionnaires were used.

Methods : The collected data were analyzed using correlation and simultaneous regression methods. The results showed that self-transcendence variables had a significant negative relationship with substance use tendency, while low mentalization and experiential avoidance had a positive and significant relationship with substance use tendency. The regression analysis also showed that these variables play a role in predicting substance use tendency.

Results : The results of this study indicate the significant role of low mentalization and experiential avoidance in predicting substance use tendency among students, which can help in identifying and improving the factors and motivations of students who have a tendency towards substance use.

Conclusion : In conclusion, this study reveals that self-transcendence is negatively associated with substance use tendency, while low levels of mentalization and experiential avoidance are positively correlated with it. These findings emphasize the significance of addressing mentalization and experiential avoidance to mitigate substance use risks among university students. By identifying and improving these factors, interventions can be developed to promote healthier behaviors and well-being in this population.

Keywords : Substance use tendency; Self-Transcendence; Avoidance; Mentalization; Experiential Avoidance; University Students

Count: 129
Abstract ID: 211
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Oral

The Effect of Pathogenic and Non-pathogenic Escherichia coli Strains on Spatial Memory and Anxiety in Rat

Submission Author: Erfan Soroush

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Background and Aim : In recent years, there has been a growing connection between neuroscience and microbiology. Preclinical studies have established the bidirectional interaction between the gut microbiota-brain axis. Changes in gut microbiota patterns have been linked to neurological and psychiatric disorders. While Escherichia coli is a well-studied bacterial species in the gut microbiota, there are still important gaps in our understanding of its pathogenesis. Certain pathogenic strains of E. coli produce a fiber called curli, which is not encoded by non-pathogenic strains. Curli play a role in host cell adhesion, invasion, and can trigger inflammatory responses. In this study, we examined the impact of pathogenic (O157:H7 EHEC) and non-pathogenic (DH5-alpha) E. coli on spatial memory and anxiety-like behavior in male Wistar rats.

Methods : The rats (n=30) were divided into three groups and orally received either PBS, pathogenic E. coli, or non-pathogenic E. coli for five weeks. After the treatment period, the rats underwent Morris Water Maze (MWM) and Elevated Plus Maze (EPM) tests to assess spatial memory and anxiety-like behavior. Subsequently, the rats were sacrificed, and their prefrontal cortex (PFC) and amygdala were analyzed for levels of exchange protein directly activated by cAMP-2 (Epac-2).

Results : The results revealed impaired spatial memory in the rats that received O157:H7 EHEC for five weeks. Additionally, anxiety-like behavior was increased in this group. Although there was a slight increase in anxiety-like behavior in the DH5-alpha group, it was not statistically significant. Moreover, spatial memory did not change significantly in the DH5-alpha group compared to the PBS-treated group. Levels of Epac-2 remained unchanged in the amygdala but showed a significant decrease in the PFC.

Conclusion : It has been established that the content and complexity of the gut microbiota directly influence anxiety and memory. Numerous clinical and preclinical studies have demonstrated that alterations in gut microbiota diversity can impact stress resilience. Consistent with the diverse effects of different E. coli strains in the intestine, our findings indicate that O157:H7 EHEC negatively affects memory and anxiety, potentially mediated by alterations in Epac-2 levels in the PFC.

Keywords : E.coli Curli Anxiety Memory Gut-Brain-Axis Microbiota

Count: 130
Abstract ID: 45
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Oral

Neural Roadmap of Positive, Negative, and Neutral Mood Induction impact on Driving Behavior Using fMRI

Submission Author: Sama Rahnemayan

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Background and Aim : The correlation between cognitive function, different mood states and their effect on driving behavior is complex and still remains unclear. The potential association between cognitive functions, mood states and their effect on driving behavior is complex and previously has been in most cases studied by subjective methods, which depend on individual differences and is therefore prone to biases. In this study, we aimed to explore the relationship between driving behavior and mood by functional magnetic resonance imaging (fMRI).

Methods : In a cross-sectional study design, 28 male right-handed drivers, aged between 20 to 30 years were randomly selected from the volunteers and included in the study. Each participant drove virtually in an fMRI compatible driving simulator, after auditory and visual positive, negative and neutral mood induction, and and fMRI was performed during driving, to explore driving-related brain activity alterations, and the impact of mood state on these effects. Pre-processing was performed to correct slice timing correction, head motion correction of people while measuring the device, spatial normalization. Statistical analysis was performed using SPM software by performing seed based connectivity analysis, after preprocessing steps.

Results : In positive mood driving, the bilateral medial prefrontal cortex (mPFC) showed positive correlations with regions such as the anterior prefrontal cortex (aPFC), dorsal anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and dorsal posterior cingulate cortex (PCC). Negative correlations were observed with the visuomotor cortex, pars orbitalis, OFC, and frontal eye fields (FEF). Negative mood driving revealed a similar network, but with more extensive regions of activation. Neutral mood driving showed similarities in connectivity patterns but with more confined regions. Comparing positive and neutral mood driving, decreased connectivity was found between mPFC and aPFC and right dorsal ACC in positive mood, while increased connectivity was observed in the OFC and parts of aPFC and dorsal ACC. Comparing negative and neutral mood driving, decreased connectivity in extensive bilateral aPFC regions was seen in negative mood, whereas increased connectivity was found in bilateral aPFC, OFC, and some left aPFC regions.

Conclusion : The present study sheds light on the influence of positive, negative, and neutral mood states on driving behavior. The observed patterns of brain activity and functional connectivity provide insights into the neural mechanisms underlying mood-induced driving behaviors and their potential impact on car accidents. The findings suggest that positive and negative mood states can affect driving behavior through distinct neurocognitive processes related to cognitive control, emotion regulation, and attentional mechanisms. Further research and the development of targeted interventions are necessary to leverage these findings in promoting safer driving practices and reducing accident risk.

Keywords : Driving behavior; mood; functional magnetic resonance imaging

Count: 131
Abstract ID: 47
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Emotional Escapades: Using Mood-Infused Videos to Promote Positive, Negative, and Neutral States

Submission Author: Sama Rahnemayan

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Background and Aim : Mood induction is a crucial technique for investigations on mood, which enables scientists to control emotional states and examine how they affect mental and behavioral functions. The creation of quick and effective techniques for eliciting particular emotional states in test subjects is essential for determining how mood affects cognitive and behavioral processes. The ability to swiftly and consistently elicit certain emotional states utilizing movies composed of carefully chosen musical compositions and visual cues has not yet been adequately explored. This study provides a useful tool for mood induction that can be employed in many research and practical situations by creating a series of movies that may successfully create happy, negative, and neutral emotions in viewers within five minutes.

Methods : In this study, the combination of images and music were used to induce mood. To induce each type of mood, a total of 15 two-minute videos (5 videos for each type of creation) were made using music pieces, selected after reviewing previous studies and consulting with experts in the field of music, and selected images for mood induction were selected from The International Affective Picture System (IAPS) collection. The emotional state of the participants was evaluated by choosing one of nine adjectives adapted from the Nature of Moods Questionnaire which included three hierarchical adjectives related to each mood. After a 2-minute waiting period,

participants were asked to choose one of the nine adjectives. Then they watched the first video on the monitor. Music pieces were presented through speakers. After the assessment of induced mood immediately after the end of the video by the questionnaire, there was a 4-minute rest period. During this phase, participants were asked to rate their emotional state two and four minutes after the end of the video, using the provided tool. Once the first block was completed, participants were immediately induced by subsequent videos for a second to fourth time following the same steps as previously described. P-values less than 0.05 were considered as statistically significant. The analysis was done using SPSS version 22 throughout.

Results : All the induced positive, negative, and neutral moods in this study showed a relatively similar moderate mood induction rate (Positive: 1.61 ± 0.73, Neutral: 1.59 ± 1.74, Negative: 1.74 ± 0.81). Also there were no intragroup differences between the videos that were used to induce each mood at each time point. Furthermore, all the induced mood scores showed general significant reduction in time, regardless of movie numbers.

Conclusion : The current study adds to the corpus of knowledge on multimodal mood induction methods. Combining music and visual stimuli is a powerful way to elicit particular emotional states in a controlled laboratory environment. However, taking limitations into consideration, the generalizability of results of the present study may be constrained by the sample size of 60 participants. Additionally, subjectivity and potential response biases may be introduced when using self-report techniques to gauge emotional states.

Keywords : Emotions; Mood; Music Therapy; Visual Perception; Mental Health

Count: 132
Abstract ID: 329
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

The role of sleep quality and cognitive disorders (anxiety, depression, stress) in the medical staff of hospitals during the COVID-19 Pandemic

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Background and Aim : Hospital staff members reported increased stress-related workload when caring for inpatients with COVID-19 (“frontline hospital staff members”). Here, we tested if depression, anxiety, and stress were associated with poor sleep and lower general health, and if social support mediated these associations. Furthermore, we compared current insomnia scores and general health scores with normative data.
Methods : A total of 321 full-time frontline hospital staff members (mean age: 36.86;58% females) took part in the study during the COVID-19 pandemic. They completed a series of questionnaires covering demographic and work-related information, symptoms of depression, anxiety, stress, social support, self-efficacy, and symptoms of insomnia and general health.
Results : Higher symptoms of depression, anxiety, and stress were associated with higher symptoms of insomnia and lower general health. Higher scores of depressions, anxiety, and stress directly predicted higher insomnia scores and lower general health scores, while the indirect effect of social support was modest. Compared to normative data, full-time frontline hospital staff members had a 3.14 higher chance to complain about insomnia and a significantly lower general health.
Conclusion : Symptoms of insomnia and general health were unrelated to age, job experience, educational level, and gender. Given this background, it appears that the working context had a lower impact on individuals’ well-being compared to individual characteristics
Keywords : hospital staff members; COVID-19; depression; anxiety; stress; self-efficacy; social support; insomnia

Count: 133
Abstract ID: 569
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Circadian Disruption and Suicide Risk: Insights from Shift Work and the Brain

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Background and Aim : Shift work, characterized by irregular work hours that disrupt the natural circadian rhythm, has become increasingly common in modern society. While it offers essential services around the clock, it comes with a range of health challenges, including an elevated risk of suicide. This review explores the relationship between circadian disruption, as experienced by shift workers, and suicide risk, focusing on the neurobiological aspects. By uncovering the neural mechanisms involved, this investigation aims to shed light on the link between irregular work hours and suicidal tendencies.
Methods : A comprehensive systematic review was conducted, encompassing studies published between 2000 and 2023, sourced from databases such as PubMed, PsycINFO, and Web of Science. Keywords included "shift work," "suicide risk," "circadian disruption," "neural mechanisms," and "mental health." Eligible studies were meticulously analyzed to provide a comprehensive understanding of the neural correlates of shift work and suicide risk.
Results : The review reveals intricate neural pathways associated with circadian disruption and suicide risk. Irregular work schedules disrupt the body's internal clock, affecting sleep quality and mood regulation. These disturbances can result in alterations in brain regions related to depression and suicidal ideation, such as the prefrontal cortex, amygdala, and the serotonergic and dopaminergic systems. Additionally, shift work-induced circadian misalignment may impair executive functions and problem-solving abilities, further contributing to suicidal tendencies.
Conclusion : Understanding the neural basis of circadian disruption and its link to suicide risk is essential for addressing the well-being of shift workers. The neurobiological insights gained from this review underscore the importance of sleep hygiene, stress management, and targeted interventions to mitigate the increased suicide risk associated with irregular work hours. Workplace policies and mental health support systems should consider these neural aspects when developing strategies to safeguard the mental health of shift workers.
Keywords : Circadian disruption, shift work, suicide risk, neural mechanisms, mental

Count: 134
Abstract ID: 566
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Neurocognitive Aspects of Alexithymia in Adolescent Development

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Background and Aim : Adolescence is a critical phase marked by significant emotional and cognitive development. Understanding the neurocognitive aspects of alexithymia during this formative period is crucial for illuminating its impact on emotional processing, social interactions, and mental health. This review delves into the intersection of neurocognition and alexithymia in adolescent development, exploring the neural correlates, emotional processing, and implications for mental well-being.

Methods : A comprehensive systematic review was conducted, drawing from studies published between 2000 and 2023, sourced from databases such as PubMed, PsycINFO, and NeuroImage. Search terms included "adolescent development," "alexithymia," "neurocognition," "emotional processing," and "neural correlates." Eligible studies were meticulously analyzed to provide a comprehensive understanding of the neurocognitive dimensions of alexithymia in adolescent development.

Results : The review uncovers a multifaceted neurocognitive landscape in the context of adolescent alexithymia. Neuroimaging studies reveal distinct neural patterns, implicating regions such as the anterior insula, cingulate cortex, prefrontal cortex, amygdala, and hippocampus. These brain regions are intricately linked with emotional processing, empathy, and self-awareness. Adolescents with alexithymia exhibit alterations in the function and connectivity of these areas, resulting in difficulties in recognizing and expressing emotions. Such challenges have broader implications for emotional regulation, social interactions, and mental health.

Conclusion : Understanding the neurocognitive aspects of alexithymia in adolescent development offers valuable insights into emotional well-being and mental health. By addressing the specific brain regions and networks involved in alexithymia, targeted interventions can be developed to support adolescents in recognizing and expressing their emotions. These findings underscore the importance of early intervention and support in fostering emotional intelligence, healthy emotional regulation, and improved mental well-being among adolescents with alexithymia.

Keywords : Adolescent development, alexithymia, neurocognition, emotional processing, neural correlates, mental well-being.

Count: 135
Abstract ID: 374
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Neurodynamics of Role-Playing Intervention: Insights into the Impact of Psychodrama on Neural Pathways

Submission Author: Mohammadsadegh Razmhosseini

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Background and Aim : -Role-playing interventions have gained recognition for their potential to foster emotional expression, personal growth, and interpersonal awareness. Among these, psychodrama, a technique that combines acting and group dynamics, stands out as a therapeutic approach. This review explores the neurodynamics of role-playing interventions and their impact on neural pathways, with a specific focus on the role of psychodrama. Understanding the neural mechanisms at play is essential to shed light on the effectiveness of role-playing as a tool for personal and psychological development.

Methods : -A comprehensive systematic review was conducted, encompassing studies published between 2000 and 2023, sourced from databases such as PubMed, PsycINFO, and Google Scholar. Keywords used included "role-playing intervention," "neurodynamics," "psychodrama," "neural pathways," and "emotional expression." Eligible studies were meticulously analyzed to provide a comprehensive understanding of the neural and physiological mechanisms involved in role-playing interventions.

Results : -The review uncovers a rich tapestry of neural responses and changes associated with role-playing interventions, particularly psychodrama. Engaging in role-playing activities stimulates brain regions linked to emotional processing, empathy, and perspective-taking, including the prefrontal cortex, anterior cingulate cortex, and mirror neuron system. These activities also promote neuroplasticity, supporting the rewiring of neural pathways associated with personal and psychological development. The release of neurotransmitters, including oxytocin and endorphins, fosters feelings of trust and social bonding, contributing to the therapeutic effectiveness of role-playing interventions.

Conclusion : Understanding the neurodynamics of role-playing interventions, with a specific focus on psychodrama, provides valuable insights into their therapeutic potential. The neural responses evoked by these activities highlight their capacity to promote emotional expression, empathy, and personal growth. This knowledge supports the integration of role-playing interventions, including psychodrama, into mental health and personal development programs, emphasizing the role of neural pathways in psychological well-being and interpersonal awareness.

Keywords : Role-playing intervention, neurodynamics, neural pathways, emotional expression, personal growth, psychodrama, therapeutic approach.

Count: 136
Abstract ID: 375
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Neurological Pathways of Impulsivity Leading to Behavioral Addiction

Submission Author: Mohammadsadegh Razmhosseini

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Background and Aim : Impulsivity, characterized by hasty actions without adequate forethought, has been recognized as a significant factor in the development of behavioral addictions. This review delves into the intricate neurological pathways associated with impulsivity and how they contribute to the emergence of compulsive behaviors that define addiction. Understanding the neural mechanisms underlying this transition from impulsive actions to addictive patterns is essential to addressing and mitigating the complexities of behavioral addiction.-

Methods : -A comprehensive systematic review was conducted, encompassing studies published between 2000 and 2023, sourced from databases such as PubMed, PsycINFO, and Web of Science. Keywords employed included "impulsivity," "neurological pathways," "behavioral addiction," "compulsive behaviors," and "neurobiological mechanisms." Eligible studies were meticulously analyzed to provide a comprehensive understanding of the intricate neurological processes connecting impulsivity to behavioral addiction.

Results : -The review reveals a complex web of neural processes that underlie the connection between impulsivity and behavioral addiction. Impulsivity is closely linked with alterations in brain regions responsible for impulse control and reward processing, including the prefrontal cortex, anterior cingulate cortex, and the mesolimbic dopamine system. These neural changes contribute to difficulties in delaying gratification and processing rewarding stimuli, thus rendering individuals susceptible to the development of addictive behaviors. Genetic predispositions, environmental factors, and imbalances in neurochemical systems further intersect to heighten the risk of behavioral addiction.

Conclusion : Unraveling the neurological pathways through which impulsivity leads to behavioral addiction provides crucial insights for addiction prevention and treatment. Understanding the neurobiological underpinnings highlights the challenges individuals with impulsivity face in resisting impulsive actions and the subsequent development of compulsive behaviors. Tailored interventions addressing the neural mechanisms, such as cognitive-behavioral therapy and pharmacological treatments, hold promise for reducing the risk of behavioral addiction and promoting healthier impulse control.

Keywords : Impulsivity, neurological pathways, behavioral addiction, compulsive behaviors, neurobiological mechanisms, impulse control.

Count: 137
Abstract ID: 350
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Study protocol: Effects of virtual reality exercise on patients with schizophrenia

Submission Author: Farimah Mahinpour

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Background and Aim : Schizophrenia is a mental illness with a high and severe prevalence (1), in recent years, the lack of physical activity and the existence of metabolic disorders in people with schizophrenia, has raised the importance of exercising(2) Schizophrenia is a chronic and debilitating mental disorder. About one percent of the world's population is affected by this disorder. After a century of study and research on schizophrenia, the cause of this disorder has not been determined. Drug treatments have been used by patients for almost half a century, but there is little evidence that these treatments improve the majority of people with schizophrenia. (3) The use of virtual reality (VR)—interactive immersive computer environments—allows social environments to be controlled and offers exciting useful applications and methods for research and therapy. (4) Virtual reality helps individuals to experience the environment they are in and increase mental simulation. (5) Exercise is a beneficial treatment for adults with schizophrenia, but there is a lack of research on suitable physical activities for those living in confined environments.

Methods : Participants for this study are selected from a psychiatric hospital located in Tehran. Participants were selected if: (a) diagnosed with schizophrenic disorder and (b) able to participate in physical activities that required musculoskeletal movement without problems. Stage 1: SFT test and 10-meter walking are performed three times for 3 weeks. In stage 1, no structured exercise program is performed in the hospital. Patients receive their usual medical treatment at this time. Stage 2: The use of the VR protocol is commonly seen among people involved in the Nintendo Wii-Fit software. This software has gained considerable popularity in rehabilitation, it is designed for those who find themselves unable to participate in concrete physical exercises due to numerous physical barriers (Pompeu et al., 2012). The Wii-Fit program is enhanced with an elegant balance board, that determines the participants' movements and sends the data from the movements to the

system. Over the course of 8 weeks, individuals afflicted with schizophrenia engaged in a virtual immersion program 3 instances per week, each session lasting for a duration of 35 minutes. In stage 2, The SFT and 10-meter walking test is performed every week, a total of 8 times. Each VR program includes 5 minutes of stretching, 25 minutes of virtual reality exercise, and 5 minutes of stretching at the end of the program

Results : The results and analysis are based on a visual interpretation of raw data. because this research is based on a study protocol, the results will be determined after it is done.

Conclusion : Regular physical activity can significantly improve the physical and mental health of these patients, while also eliminating the harmful effects of a sedentary lifestyle. Virtual reality sports programs offer a unique and innovative approach to overcoming barriers to participation in physical activity and can provide a highly engaging and enjoyable experience. Ultimately, the choice between physical activity and virtual reality exercise should be based on individual preferences, accessibility, and effectiveness in promoting sustainable behavior change.

Keywords : SCHIZOPHRENIA, EXERCISE, PATIENT, VIRTUAL REALITY, DISORDER, virtual reality exercise

Count: 138
Abstract ID: 557
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Identification of Schizophrenia through Electroencephalography (EEG) Power Spectrum Density (PSD) and Functional Connectivity (FC) using Convolutional Neural Networks (CNNs)

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Background and Aim : Schizophrenia (SZ) is a neuropsychiatric disorder characterized by complex impairments. Electroencephalography (EEG) analysis plays a vital role in neuroscience and clinical uses. SZ is associated with EEG connectivity patterns and power spectrum density, particularly in the front-central brain regions. Machine learning techniques and neural networks are widely used in EEG analysis. This study seeks to improve automatic classification of SZ based on the EEG features. This research introduces a multidomain Convolutional Neural Networks (CNNs) to classify EEG-derived features related to SZ.

Methods : This study according to Su Mi Park. et al (2021) employs a publicly available EEG dataset, Including SZ patients and healthy controls. The used dataset includes 117 Schizophrenia and 95 healthy controls (aged from 18 to 70 years) and a combination of QEEG parameters including power spectrum density (PSD) and functional connectivity (FC) at frequency bands. These parameters were calculated in the following frequency bands: Delta (1-4 Hz), Theta (4-8 Hz), Alpha (8-12 Hz), Beta (12-25 Hz), High Beta (25-30 Hz), and Gamma (30-40 Hz). EEG data was recorded using 19 channels. We used 19x19 connectivity matrices and 1x19 power matrices in each frequency band for network inputs. 20% of the data was set aside for the test set and the remaining data was used for the cross-validation 5-fold method. Each of the power and connectivity networks was trained separately and then given as inputs to the merged network. The merged CNN architecture fuses these features, resulting in improved classification performance.

Results : Our findings show that merging two networks improves accuracy. The best accuracy belonged to Delta Wave Power and Connectivity, which had an average validation accuracy of 92.89% and an average test accuracy of 92.55%. The best fold test accuracy was 97.67%

Conclusion : Studies show that there are differences in EEG connectivity and power at different brainwave frequencies in SZ individuals compared to healthy individuals. EEG studies have produced conflicting results, with reports of both increased and reduced delta/theta band coherence and intact and reduced beta-band connectivity in SZ. Some researchers examined EEG band powers and found significant increases in delta and theta bands, particularly in the frontal areas of SZ subjects. Our results showed that the combination of delta wave power and connectivity has the highest classification accuracy between schizophrenic and healthy individuals. The merged CNN architecture devised in this study effectively captures the perturbed neural activity patterns in SZ patients, by merging the power and connectivity features of EEG electrodes enabling precise classification. The framework is versatile and can be applied to other neuropsychiatric disorders characterized by power and connectivity anomalies. The results underscore the potential for developing computer-assisted diagnostic tools and clinical applications in the realm of neuropsychiatric disorders.

Keywords : Schizophrenia; Electroencephalography; Deep learning; Convolutional Neural Networks; power spectrum density; functional connectivity

Count: 139
Abstract ID: 476
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Study protocol: Comparing the effect of tDCS and rhythmic games on schizophrenia patients

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Background and Aim : Schizophrenia is a psychological problem (heterogeneous condition) that can appear with (I) daydreams, fantasies, very cluttered thinking (discourse), disarranged conduct (on the whole certain side effects), (ii) level effect, amotivation, anergy, and inability to keep up with cleanliness (negative side effects) (Biedermann and Fleischhacker, 2016) The middle lifetime grim gamble for schizophrenia is roughly 0.72% (McGrath et al., 2008), and the beginning of side effects of the infection normally happens between late puberty and the mid 30s of life.(Fallon et al., 2003). Antipsychotics are the first-line treatment for schizophrenia. In any case, it is assessed that around 10-30 % of patients with schizophrenia show practically no reaction to antipsychotics, and another 30 % experience remaining side effects in spite of antipsychotic treatment (Hasan et al., 2012). Rhythmic games are a sort of endlessly interesting games with music, whose primary object is imperativeness and expanding development and interactive abilities. Rhythmic games with music and collaboration lift everyone's spirits, newness and satisfaction and channel negative energies. Rhythmic games fortify exactness and fixation because of coordination between all body parts during the game. The motivation behind this composing convention is which of the intercessions 1. TDCS 2. Rhythmic games greaterly affect the recuperation of patients with schizophrenia.

Methods : In this review, 50 schizophrenic patients of the two genders (male and female), between the ages of 18 and 40 years, were chosen as examination tests. We separated the examples into 2 gatherings of 25 individuals. "1. The principal bunch: incorporates 25 patients who are treated with tDCS notwithstanding drug treatment. "2. The subsequent gathering: incorporates 25 patients who are treated with musical games notwithstanding drug treatment. Protocol : Step 1: In addition to drug treatment, patients receive tDCS stimulation for 3 weeks, in 12 sessions (4 sessions per week),

duration of stimulation is 20 minutes with an intensity of 2 milliamps. In TDCS, we use two channels for stimulation and inhibition. 1- The excitatory part in the DLPFC and the inhibitory part in the occipital. 2- The stimulating part on m1 and the inhibiting part above the eye cavity Step 2: In addition to drug treatment, patients should receive rhythmic games (This innovative game is played with body percussion as well as sticks and glasses.) for 3 weeks, 150 minutes per week (3 days per week).

Results : The current study is a kind of the protocol study and now we don't have any results

Conclusion : By including rhythmic games and tDCS in the treatment of patients with schizophrenia, psychologists can help improve their overall quality of life and reduce the burden of physical health problems associated with this disorder.

Keywords : tDCS , rhythmic games , schiziphrenia , schizophrenia patients

Count: 140
Abstract ID: 88
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Adaptive Immunity in schizophrenia: The role of gut microbiota

Submission Author: Sara Seraj

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Background and Aim : Recently, immunopathogenesis has emerged as one of the most convincing etiopathological models of schizophrenia, which indicates the background of immune-based chronic inflammation. The role of the adaptive immune system in schizophrenia shows changes in defense mechanisms such as changes in the function of T cells and a shift towards B cells. Adaptive immunity is usually established on the B and T cell population, but it also includes the host's microbiome. The microbiota of the gastrointestinal tract is a complex system with a great variety of organisms located in the intestinal tract and has an important place in human disease and health. The aim of this study is to investigate the effect of intestinal microbiome and adaptive immunity on schizophrenia.-

Methods : This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords schizophrenia, adaptive immunity, gut microbiota, 77 articles related to inclusion criteria were extracted and then analyzed.

Results : The results indicate that the gut microbiota plays a key role in the immunopathogenesis of schizophrenia and the basic pathways involved in the etiopathophysiology of schizophrenia are also regulated by the gut microbiota-brain axis. And they show the role of adaptive immunity through Toll receptors (TLRS) and their activation by bacterial translocation, as a result of intestinal dysfunction, in the pathophysiology of schizophrenic psychotic disorders.

Conclusion : These promising studies have enormous potential to provide advances in the field of immunology and neuroscience, and future research should examine several microbially targeted therapies to improve symptoms and reduce the immune disturbances observed in patients with schizophrenia

Keywords : Schizophrenia, adaptive immunity, gut microbiota

Count: 141
Abstract ID: 71
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

The significance of cytokines in the development of schizophrenia

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Background and Aim : Schizophrenia is one of the mental diseases that causes positive and negative and cognitive symptoms and is caused due to disruption in neurotransmitter systems, oxidative stress and imbalance between free radicals and antioxidant system. It also implicates immunological dysfunction as a key point in its pathomechanism. Cytokines, whose altered levels have been reported in most diseases, are the main mediators in coordinating the immune system. The aim of this study is to review the amount of cytokines and their effects on schizophrenia.

Methods : This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords Schizophrenia, cytokine, neuroinflammation, 54 articles related to inclusion criteria were extracted and then analyzed.

Results : The results of studies indicate that there is a significant imbalance in the balance between pro-inflammatory cytokines such as interleukin 1 beta, interleukin 6 and anti-inflammatory cytokines such as interleukin 10. So that their imbalance during pregnancy can lead to fetal schizophrenia. to be Also, high levels of pro-inflammatory cytokines lead to excessive activation of astrocytes and microglia and presynaptic stimulation of dopaminergic receptors in the midbrain. The wide range of cytokine levels and their diversity can make the investigation difficult, but with a more practical approach, an overview can be provided.

Conclusion : In this study, we investigated the disorders of the cytokine system in the process of schizophrenia, as well as its possible relationships, such as the impact of trauma, intestinal microbiome, etc. Patients have shown.

Keywords : Schizophrenia, cytokine, neuroinflammation.

Count: 142
Abstract ID: 347
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Neuropil Alteration of the Habenula Nucleusin the Experimental Model of Schizophrenia Induced by Ketamine

Submission Author: Fatemeh Imanparast

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Background and Aim : Neuropil is a densely packed network of glial processes, neuronal processes, extracellular matrix, and microvascular in the central nervous system. The habenula nucleus is one of the brain regions contributing actively to emotional processing and regulating negatively motivated behaviors. This study aimed to examine the neuropil alteration of the habenula nucleus in the experimental model of schizophrenia.

Methods : Twenty adult Wistar rats were randomly divided into two groups. The experimental group received ketamine at a dose of 10mg/kg intraperitoneally for one week. The control group was treated with saline. At the end of the experiment, animals were deeply anesthetized, the brains were removed, and Paraffin-embedded sections of 10µm thickness were cut on microtome. The randomized sections were stained with H&E. The position of the HB was recognized, and the neuropil surface area was measured according to the stereology method.

Results : The surface area of the right (9841±1355µm2) and the left (9110±1390.5 µm2) habenula nucleus showed a meaningful difference in comparison with the right (1134±272µm2) and the left (1247±348 µm2) habenula nucleus of the control group (p=0.000). The number of astrocytes in the right HB of the experimental group (440±96.2) and the left HB of the experimental group (422±103.2) showed a meaningful difference in comparison to those of the control group (RHB: 97±31.1 and LHB: 88±9.08) (p=0.000)

Conclusion : The results of this study showed that an experimental model of schizophrenia leads to neuropil expansion in the habenula nucleus.

Keywords : Gliosis;Habenula;Neuropil;Schizophrenia

Count: 143
Abstract ID: 525
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

Association of the c.385C>A (p.Pro129Thr) polymorphism of the fatty acid amide hydrolase gene with eating disorders, drug abuse, and mood-related disorders: A systematic review

Submission Author: Nazanin Hatami bavarsad

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Background and Aim : -Fatty acid amide hydrolase (FAAH) is one of the important enzymes of the endocannabinoid (eCB) system, which degrades anandamide. The purpose of this study was to investigate the relationship between polymorphisms in the FAAH gene with some disorders.

Methods : -Out of 110 articles published in valid databases from 1997 to 2023on the relationship between FAAH and its polymorphism and eating disorder, drug abuse, and mood-related disorders, 34 articles were selected.

Results : -Some studies have shown a link between different genes in eCB, including FAAH and their polymorphism with dysfunction of various components of eCB system. Also, the association between genetic variability in genes of this system and some disorders related to this system has also been investigated. For example, genetic studies have shown a link between polymorphism of FAAH and the risk of eating disorders, or between FAAH polymorphism and abuse of different drugs. Another study revealed an association between polymorphism of FAAH and fear-related behaviors, like anxiety and depression.

Conclusion : More research and attention are needed to clarify the relationship between eCB and FAAH polymorphism and eating disorders, drug abuse, and mood-related disorders, which has been increasing in recent years, and also to answer many questions in this regard.

Keywords : Polymorphism; Fatty acid amide hydrolase (FAAH); Eating disorder, Drug abuse, mood-related disorders

Count: 144
Abstract ID: 536
subject: Neuropsychiatry and Psychology: Disorders of Executive Functions
Presentation Type: Poster

The effectiveness of computer-based cognitive rehabilitation (Maghzineh), on the working memory of students with reading learning disabilities.

Submission Author: Mahdiyeh Radmard

Mahdiyeh Radmard[1], dr.leila kashani vahid[2], dr. hadi moradi sabzevar[3]

1. PhD student in psychology and education of exceptional children
2. dr
3. dr

Background and Aim : Cognitive rehabilitation consists of a set of targeted programs that are designed to repair or enhance cognitive functions, including working memory. Today, the issue of working memory in learning has been proven to be problematic for children with learning disabilities. Therefore, this study was conducted to investigate the effectiveness of computer-based cognitive rehabilitation on the working memory of children with reading disabilities.
Methods : This study was conducted using a semi-experimental approach with a pre-test-post-test-follow-up design. The statistical population of the study consisted of 9 to 13-year-old students with reading disabilities in the city of Sirjan. Thirty participants were selected through purposive sampling and randomly assigned to two groups: experimental group (15 participants) and control group (15 participants). The experimental group received intervention in 30 sessions, while the control group did not receive any intervention. The performance of the children was assessed before and after the intervention using the N-back test. Data analysis was performed using repeated measures analysis of variance (ANOVA).In this study, the N-back test was used as the research tool. In this test, the student responds to visual stimuli, which consist of a series of numbers (congruent - incongruent), in three stages: pre-test, post-test, and follow-up.
Results : The findings indicate that there was a significant difference in working memory performance between the experimental and control groups in the post-intervention assessment. Computer-based cognitive rehabilitation had a significant effect on improving working memory performance in children with reading disabilities.
Conclusion : In general, it can be concluded that computer-based cognitive rehabilitation using the brain training paradigm is a beneficial complement for improving and enhancing working memory in students with reading disabilities. It can be considered an effective and useful method for improving working memory performance in this group of students.
Keywords : Computer-based cognitive rehabilitation (Maghzineh), working memory, reading disabilities.

Count: 145
Abstract ID: 648
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Investigating the effectiveness of cognitive behavioral group therapy on psycho-social and emotional adaptability and cognitive flexibility in people with multiple sclerosis in Hamedan, Iran

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Background and Aim : Multiple sclerosis is a chronic disease that profoundly impacts the patient's life. This study investigates the effectiveness of cognitive behavioral group therapy on psycho-social and emotional adaptability and cognitive flexibility in patients with multiple sclerosis in Hamedan city.
Methods : The current study was semi-experimental and was designed with a pretest–posttest and follow-up with a control group. The statistical population included all people suffering from MS who referred to the MS association in Hamedan, Iran, in 2022, among whom 30 people were selected by sampling and randomly assigned to two experimental and control groups (each group of 15 people). The experimental group received cognitive behavioral intervention during eight sessions of 90 min weekly. The control group did not receive any interventions. The subjects were re-evaluated after 2 months for follow-up. The data were collected using a psycho-social adaptability with illness scale questionnaire, Bell's emotional adjustment questionnaire, and cognitive flexibility inventory questionnaire. The data were analyzed using variance analysis with repeated measurements using SPSS-21 software.
Results : The results revealed that the cognitive behavioral therapy intervention significantly impacted the improvement of psycho-social and emotional adaptability and cognitive flexibility compared to the control group. This impact persisted until the follow-up stage.
Conclusion : Cognitive behavioral therapy removes cognitive barriers related to attitude and self-management by increasing the information, which improves psycho-social and emotional adaptability, cognitive flexibility, and, consequently, self-care behaviors.
Keywords : Multiple sclerosis · Psycho-social adaptability · Emotional adaptability · Cognitive flexibility

Count: 146
Abstract ID: 344
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Vitamin B12 reversed anxiety and depression induced by adolescent nicotine withdrawal through alteration the inflammatory, oxidative and serotoninergic profiles in male rats

Submission Author: Hossein Pahlavani

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Background and Aim : The present study aims to assess the effect of vitamin B12 (Vit B12) on depression-like behavior caused by nicotine (Nic) withdrawal, which is more likely due to the anxiogenic effect of Nic in adolescent male rats, through assessing behavioral and biochemical analysis.

Methods : Adolescent male rats were divided into vehicle (received normal saline), and experimental groups that received Nic (2 mg/kg, intraperitoneally (i.p.)) for three consecutive weeks and after that, the group that received normal saline was divided into two groups, one of which returned to a regular diet, and the second one received Vit B12 (1.5 mg/kg). The Nic group was divided into five groups, one of which received bupropion (Bup, 20 mg/kg), three of which received different doses of Vit B12 (0.5, 1, and 1.5 mg/kg), and the last one returned to a normal diet without treatment, which was considered as the withdrawal period.

Results : Behavioral analysis showed that Nic withdrawal induced anxiety and depression. Vit B12 and Bup reduced anxiety and depression induced by Nic withdrawal. The biochemical analysis demonstrated the more activity of oxidative stress factors and pro-inflammatory cytokines in which Nic was administered, whereas both Vit B12 and Bup reversed the results and improved the activity of both antioxidant and anti-inflammatory parameters. Furthermore, both serum and cortical Vit B12 levels dramatically decreased in nicotine group, whereas treatment with both Vit B12 and Bup as desirable treatments corrected Vit B12 levels.

Conclusion : According to the present findings, the results revealed that Vit B12 is comparable with Bup in attenuation of Nic withdrawal symptoms. In addition, both Bup and Vit B12 improved the decreased serum and cortical levels of Vit B12, which caused by nicotine. Administration of Vit B12 in normal animals demonstrated better results in reducing antioxidant and anti-inflammatory parameters, which explores new hope to introduce Vit B12 as a novel antioxidant and anti-inflammatory agent to treat not only withdrawal, but also other diseases related to the prominent role of oxidative stress or inflammatory pathways, such as Alzheimer's disease.

Keywords : Nicotine; Withdrawal; Vitamin B12; Bupropion; Depressive-like behavior

Count: 147
Abstract ID: 259
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Vitamin D3 administration ameliorates the anxiety and depressive-like behavior induced by nicotine withdrawal: A mechanistic focus on oxidative stress, inflammatory response and serotonergic transmissi

Submission Author: Farimah Beheshti

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Background and Aim : Background: Considering numerous evidences on increasing concerns about psychiatric disorders especially the increased prevalence of anxiety and depressive-like behavior following nicotine withdrawal, and the promising role of vitamin D3 (Vit D) in mood stability, the present study conducted to assess whether Vit D supplementation could ameliorate the anxiety and depression induced by nicotine withdrawal in male adult rats.

Methods : Methods: Male rats were divided into vehicle, and experimental groups that received Nic (2 mg/kg, intraperitoneally (i.p.)) for three consecutive weeks and after that, the vehicle group that was divided into two groups, one of which returned to a regular diet, and the second one received Vit D (100000 IU). The Nic group was divided into four groups, three of which received different doses of Vit D (1000, 10000, and 100000IU), and the last one returned to a normal diet without treatment, which was considered as the withdrawal period.

Results : Results: Behavioral analysis showed that Nic withdrawal induced anxiety and depression. Vit D reduced anxiety and depression induced by Nic withdrawal. The biochemical analysis demonstrated the more activity of oxidative stress factors and pro-inflammatory cytokines in which Nic was administered, whereas Vit D reversed the results and improved the activity of both antioxidant and anti-inflammatory parameters.

Conclusion : Conclusion: Present findings and accumulating evidences have confirmed the protective effect of Vit D on numerous disorders including psychiatric diseases as well as cognitive dysfunction. Vit D has strong potential to introduce as anxiolytic and anti-depressant agent along with alleviating other negative effects following nicotine withdrawal; however, further investigation is needed in larger sample size to discuss more confidently.

Keywords : Nicotine; Withdrawal; Vitamin D3; Depressive-like behavior

Count: 148
Abstract ID: 266
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Knowing the memory centers in the brain

Submission Author: Fatemeh Sadeghi

Fatemeh Sadeghi [1]

1. Fatemeh sadeghi

Background and Aim : Considering the extensive function of memory in everyday life and the extensive brain centers that are involved in this matter. This raises the concern that these centers are accurately identified

Methods : The results of the encephalography device EEG charts Images from fmri

Results : Identifying centers related to memory function in the brain

Conclusion : The hippocampus and the amygdala play an important role in memory function, which is discussed in the article

Keywords : Nerve Psychology. cognition

Count: 149
Abstract ID: 152
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Cognitive effects of oxybutynin; a systematic review

Submission Author: Amirreza Naseri

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Background and Aim : Oxybutynin is an antimuscarinic utilized as a treatment for overactive bladder. This study aims to investigate the effects of oxybutynin on cognitive function.
Methods : Following the PRISMA statement, clinical trials which assessed the cognitive effects of oxybutynin in cognitively-intact individuals were included. A systematic search was conducted through Embase, PubMed, Cochrane, Scopus, and web of science with “Oxybutynin” and “cognition, memory, attention, executive function, learning”. The risk of bias was assessed using the JBI checklists.
Results : Out of 843 records, 8 studies including 7 RCTs, met our inclusion criteria. The overall quality of the studies was low. In comparison to the placebo, the oral form of oxybutynin did not affect the information process speed (IPS), attention and short-term, immediate and delayed memory based on trail-making tests, d2 attention test, developmental neuropsychological assessment, Buschke style word-list task, digit span, digit symbol, verbal fluency, finger tapping, reaction-time (RT), pattern recognition, name–face Association (NFA), and Hopkins verbal learning tests in six studies. The cognitive effects of immediate-released oxybutynin were evident in one study regarding the attention and alternates parameters. An extended-release form of oxybutynin was found to significantly affect delayed recall on the NFA and First–Last Name Association, and Misplaced Objects Tests, in one study; however, visual attention, IPS, RT, and self-rated memory were not affected.
Conclusion : The limited available evidence, suggests cognitive effects of only the extended-release form of oxybutynin.
Keywords : oxybutynin; cognitive dysfunction; memory; attention

Count: 150
Abstract ID: 105
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Coenzyme Q10 attenuated anxiety and depression-like behavior caused by withdrawal following concurrent use of ethanol and nicotine in adolescent male rats

Submission Author: Mobina Mehdizade

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Background and Aim : The present study was aimed to assess the potential effect of coenzyme Q10 on anxiety and depressive-like behavior associated with withdrawal following concurrent usage of ethanol and nicotine in adolescent male rats.

Methods : The adolescent male rats were divided into 7 groups: 1) vehicle, 2) Nico-Eth (Nico 2 mg/kg and cumulative dose of ethanol (started from 5% to reach 20% gradually, from 21 till 42 days of ages), 3-5) Nico-Eth Q10100/200/400mg/kg (received Nico-Eth and received Q10 at three doses 100/200/400mg/kg by oral gavage 43-63 days of ages), 6) Nic-Eth-Bup-Nal (received Nico-Eth and received Bupropion (20mg/kg) and naloxone (10mg/kg) at 43-63 days of ages, and 7) received normal saline from 21-42 days of age after that received Q10 400mg/kg from 43-63 days of age. Finally, they were subjected to analysis both behavioral and related biochemical variables.

Results : Considering the present findings, Q10 attenuated the anxiety-depressive like behavior associated with withdrawal following concurrent use of nicotine and ethanol by behavioral analysis. Q10 at the highest doses (400mg/kg) balanced both oxidant/anti-oxidant and pro-inflammatory/anti-inflammatory in addition to increase and decrease of serotonin and monoamine oxidase (MAO) respectively in cortical tissue. It is note-worthy that the highest dose of Q10

illustrated much better results than other doses as well as Bup and Nal, as standard medications approved for withdrawal periods caused by nicotine, and ethanol.

Conclusion : The present findings confirmed anti-oxidant and anti-inflammatory effect of Q10 along with positive effect on elevation of serotonin as an important neurotransmitter responsible for mood stability.

Keywords : Nicotine; Ethanol; Depressive and anxiety disorder; Withdrawal

Count: 151
Abstract ID: 363
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Single-dose and multiple-dose regimen of ketamine in treatment of treatment-resistant depression: A randomized clinical trial

Submission Author: Sara Moslehi

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7. دانشکده پزشکی دانشگاه علوم پزشکی آزاد تهران

Background and Aim : Background: The antidepressant effects of ketamine, even at doses below anesthetic effect, have been well established, but it is unclear whether the therapeutic effects of a single dose of the drug will be similar to intermittent injections. Objectives: We aimed to evaluate the effect of ketamine at intermittent doses over 3 weeks in comparison with a single dose of ketamine as control group in treatment-resistant depression.

Methods : In this randomized single-blinded clinical trial study, 30 patients with treatment-resistant depression were randomly assigned to schedule for single-dose or intermittent-dose regimens of ketamine. The subjects were evaluated after receiving the sixth dose of the drug at intervals of two hours after receiving ketamine, two days, one week; two weeks, and then one, two and three months after receiving ketamine by the Hamilton test.

Results : Assessing the mean Hamilton score before and at different time points after treatment in the two treatment subgroups showed no difference in this score. In the assessment of trend of the

changes in mean Hamilton score during the three months after treatment showed a significant decrease in the depression score in both groups ($p < 0.001$), however, the trend of these changes was not different between the two groups.

Conclusion : No significant difference is observed between the use of single-dose and multiple-dose regimen of ketamine in treatment of treatment-resistant depression.

Keywords : ketamine; depression; efficacy; dosage

Count: 152
Abstract ID: 358
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Neurofilament light chain as a novel biomarker of depression: A systematic review and meta-analysis

Submission Author: Adrina Habibzadeh

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Background: Depression is a common and serious mental health condition that severely affects daily functioning. Neurofilament Light (NfL) has been identified as a promising biomarker. Associated with axonal neuronal damage, potentially aiding in early diagnosis, personalized treatment, and tracking depression's progression. This study used meta-analysis to evaluate the potential of plasma NfL as a biomarker for depression patients. Methods: A systematic search was conducted across PubMed, Web of Science, and Scopus databases to find studies on plasma NfL levels in depression. A meta-analysis was then used to determine its potential as an accurate biomarker for distinguishing depression patients from healthy controls. Results: Our meta-analysis, based on five studies with ten datasets, revealed that plasma NfL levels were notably higher in individuals with depression (407 cases) compared to healthy controls (406 individuals). The calculated weighted mean difference (WMD) was 7.88 (95% CI: 4.70 to 11.07), indicating a significant effect size, although substantial heterogeneity was observed (heterogeneity Chi-Square: 60.72, $p < 0.05$). Subgroup analyses based on depression type, control type, and analysis method consistently supported the association between NfL and depression, strengthening the evidence. Conclusion: In our study, NfL was suggested to be a global diagnostic biomarker for depression. Moreover, it could be used in the differential diagnosis of unipolar, bipolar, and significant depressive disorders. Nevertheless, further research and validation are warranted to establish the clinical applicability and diagnostic potential of NfL in depression.

Keywords : Neurofilament light chain; Depression; biomarker; Mood disorder

Count: 153
Abstract ID: 16
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

The use of medicinal plants in the treatment of Alzheimer's disease

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Background and Aim : Alzheimer's disease is one of the most devastating brain disorders of elderly humans. It is an undertreated and under-recognized disease that is becoming a major public health problem. Currently, there is no definitive cure for this disease, but new treatments are opening up new horizons about the biology of this disease.The last decade has witnessed a steadily increasing effort directed at discovering the etiology of the disease and developing pharmacological treatment. The purpose of this article is to review the evidence from controlled studies to determine whether medicinal plants can be useful in the treatment of cognitive impairment caused by Alzheimer's disease in the elderly, and to examine the effects of a number of common types of medicinal plants used to treat Alzheimer's disease
Methods : In this study, using the databases of web of science, scopus, pubmed, pubmed central, SID and the keywords of Alzheimer's disease, medicinal plants, acetylcholine, antioxidant, studies on Alzheimer's disease were investigated.
Results : The first neurotransmitter defect discovered in Alzheimer's disease involves acetylcholine, which is a cholinergic neurotransmitter and is required for short-term memory. Cholinergic deficits in Alzheimer's disease are responsible for most of the short-term memory problems. there is no doubt about the therapeutic effectiveness of cholinesterase inhibitors and NMDA receptor antagonists in the treatment of Alzheimer's disease, but these treatments do not prevent the progression of this disease and lose their effectiveness in the long run. medicinal plant products including saffron, walnut, turmeric, ginseng, sage, frankincense, lemon balm have good effects in the treatment of mental and behavioral symptoms of Alzheimer's.
Conclusion : Although medicinal plants and traditional medicine can affect brain function to some extent, in general, no treatment can replace medical care and standard recovery methods. For this reason, our usual advice to people is to see a doctor as soon as possible if they notice symptoms of forgetfulness or Alzheimer's. Also, although the use of herbal medicines has many properties and benefits for people's health, its excessive use can be dangerous and have many side effects
Keywords : Alzheimer's disease, medicinal plants, acetylcholine, antioxidant

Count: 154
Abstract ID: 110
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

Cognitive appraisals of disability

Submission Author: Maryam Shabany

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Background and Aim : -To describe the meaning of cognitive appraisals (primary and secondary), their relation with outcome measures, and special appraisal scales after Spinal Cord Injury (SCI) in the existing literature.

Methods : -This review was performed according to the Arkseyand O'Malley framework that consisted of five steps: setting the review question, searching the literature, selecting and classifying the studies, charting the data, and summarizing the results. Studies involving published articles from 1990 to now, studies related to cognitive appraisal, individuals with traumatic SCI (TSCI), and patients older than 18 years were identified by searching by key terms in four databases (PubMed, Web of Science, Scopus, and Embase).

Results : -Twenty-eight studies were included, which have been categorized into three different categories: a) the meanings of cognitive appraisals in TSCI (n=2): appraisals are complex and context-related, b) appraisals and outcome measures/coping (n=21): that there was a relationship between cognitive appraisals and physical/psychological/social aspects of outcomes, c) The Appraisals of Disability: Primary and Secondary Scale (n=5): that appraisals can be used as predictor scales and can reflect resilience.

Conclusion : The results showed that a cognitive appraisal of the debilitating event is very important for long-term outcome rehabilitation in individuals with SCI following road accidents and other trauma. Physical/psychological training programs can help improve initial appraisal. Finally, appraisals can improve the way people react to the event and increase quality of life.

Keywords : Cognitive appraisal, stress appraisal, Spinal Cord Traumas

Count: 155
Abstract ID: 179
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

The eficacy of Vitamin B6 and alpha-lipoic acid in preventing levetiracetam depressant-like behavior in mice

Submission Author: Azadeh Mesripour

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Background and Aim : Some antiepileptic drugs for instance levetiracetam cause depression side effect in patients. Vitamin B6 is decarboxylase enzyme cofactor that synthesis the neurotransmitters involved in depression, and also gamma-aminobutyric acid that is useful for preventing seizer. α-Lipoic acid (ALA) is a natural body antioxidant and a necessary mitochondrial cofactor that can prevent neuronal damage. The aim of this study was to evaluate the effectiveness of these two supplements for preventing levetiracetam depression initiation in mice.

Methods : Male NMRI mice (weighing 25±3 g) were used. The drugs were all administered intraperitonealy for 14 consecutive days, including: levetiracetam (20 mg/kg), and pretreatments with ALA (20, 40 mg/kg), vitamin B6 (100 mg/kg), or imipramine (10 mg/kg) as the control positive, and the control group received normal saline. The volume of drug administration was 10 ml/kg. the locomotor test and forced swimming test (FST) were performed on days 7 and 15 on same groups of animals, novelty suppressed feeding test (NSFT) was performed on day 16.

Results : Immobility time in FST increased following levetiracetam administration (day 7, 166±5.63s vs control 135±9.9s, p=0.020; day15, 188±6.45s vs control 150±9.55s, p=0.0326). Pretreatment with B6 significantly reduced the immobility time during FST (day7,109±16.4s, p<0.001; day15, 124±12s, p<0.001 vs levetiracetam alone), these changes were similar to imipramine. These behavioral changes were observed in the absence of treatment effects on locomotor activity. But following ALA pretreatment at the first week the locomotor activity declined that was followed by an increase in the immobility time during FST. After the second week ALA 40 mg/kg pretreatment induced lower locomotor activity and neither of ALA doses

reduced immobility time during FST. During NSFT, while pretreatment with B6, and ALA (20, 40 mg/kg) similar to imipramine decreased the latency, but only B6 and ALA 20 mg/kg increased food intake compared to levetiracetam alone.

Conclusion : Vitamin B6 pretreatment prevented depressive-like behavior induced by levetiracetam. ALA interaction with levetiracetam decreased locomotor activity and depressive like behavior was only relevant by NSFT following ALA 20 mg/kg administration. Supplements are recommended for further evaluation to prevent depression comorbidity of antiepileptic drugs.

Keywords : depression; antiepileptic; levetiracetam; vitamin B6; α-lipoic acid

Count: 156
Abstract ID: 300
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

Brain circuits involved in depression

Submission Author: Gholam Hossein Meftahi

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Background and Aim : -Depression, which affects approximately 17 percent of the population in distinct ways, has profound personal and economic implications. It has been proven through studies that depression as well as other mood disorders are linked to modifications in brain structure, notably a reduced volume of specific regions involved in emotional and mood control, thereby contributing to the development of stress-related mental conditions.

Methods : -Shrinkage is a frequently observed change in the brain of patients with depression, particularly in regions such as the hippocampus, thalamus, frontal cortex, and prefrontal cortex.

Results : - Anatomical MRI studies have discovered various gray matter alterations in the frontal lobe, temporal lobes (including the hippocampus and amygdala), parietal lobe, cerebellum, putamen, pallidum, thalamus, and caudate. Also, investigations demonstrated that white matter alteration occurred in the superior frontal gyrus, inferior temporal gyrus, hippocampus, cingulum, and parietal regions. In depression, various regions of the brain interconnect and ultimately create intricate networks. However, at the neural circuit level, the contribution of dysfunction in these brain areas to specific depression-related behaviors and symptoms is not well comprehended, and it is still unclear what leads to the malfunctioning of these circuits. Nevertheless, these modifications are not lasting and can be obstructed or reversed with behavioral and pharmacological interventions.

Conclusion : Depression, which affects approximately 17 percent of the population in distinct ways, has profound personal and economic implications. It has been proven through studies that depression as well as other mood disorders are linked to modifications in brain structure, notably a reduced volume of specific regions involved in emotional and mood control, thereby contributing to the development of stress-related mental conditions. Shrinkage is a frequently observed change in the brain of patients with depression, particularly in regions such as the hippocampus, thalamus,

frontal cortex, and prefrontal cortex. Anatomical MRI studies have discovered various gray matter alterations in the frontal lobe, temporal lobes (including the hippocampus and amygdala), parietal lobe, cerebellum, putamen, pallidum, thalamus, and caudate. Also, investigations demonstrated that white matter alteration occurred in the superior frontal gyrus, inferior temporal gyrus, hippocampus, cingulum, and parietal regions. In depression, various regions of the brain interconnect and ultimately create intricate networks. However, at the neural circuit level, the contribution of dysfunction in these brain areas to specific depression-related behaviors and symptoms is not well comprehended, and it is still unclear what leads to the malfunctioning of these circuits. Nevertheless, these modifications are not lasting and can be obstructed or reversed with behavioral and pharmacological interventions. Further delineating the molecular signaling pathways that underlie these modifications and formulating novel therapeutic agents are significant goals.

Keywords : Brain circuits; Anxiety; Depression; Stress

Count: 157
Abstract ID: 348
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

Endocannabinoid system, mood disorder and Single Nucleotide Polymorphism

Submission Author: Abdolrahman Sarihi

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4. Department of Psychiatry, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : In this presentation I will reviewed the the role of endocannabinoid system, in mood disorder, then I will report our resent study on Borderline personality disorder (BPD). BPD from the perspective of etiology, is a multifactorial and complex disorder, hence while our understanding about the molecular basis and signaling of this disorder is extremely limited. The purpose of this study was evaluating the relationship between BPD and Monoacylglycerol lipase (MGLL) polymorphism rs782440 in Hamadan population, Iran.

Methods : In this case-control study, 110 participants including 55 patients with BPD and 55 healthy control subjects were selected by psychiatrists in department of psychiatry at Farshchian Sina Hospital in Hamadan. The BPD patients were selected based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) scale. For genotyping, PCR was used to amplify the desired region including the SNP (rs782440) and afterward the amplicon was sequenced using the Sanger sequencing method. To determine the genotype of these patients, their sequences were aligned with reference sequence of MGLL through the CLC genomic workbench software.

Results : The results indicated that the frequency of TT in comparison to CC genotype was significantly different (P value=0.003) and the risk of BPD in TT genotype to CC genotype were increased by 6.629% . Regarding the frequency of alleles in this group, no significant difference was observed.

Conclusion : We report the association between MGLL SNP (rs782440) with BPD. The findings of the current research revealed that TT genotype increases the risk of BPD compared to CC genotype. Considering the lack of a suitable diagnostic biomarker for BPD, using this potential biomarker in near future can be promising.

Keywords : MGLL; Borderline Personality Disorder (BPD); polymorphism; rs782440

Count: 158
Abstract ID: 490
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Applications of artificial intelligence in anxiety and depression management

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Anxiety and depression are among the most common mental health conditions, with a high worldwide prevalence, impacting many people in their lifetimes. They have an economic impact on society and lead to years of lost productivity. Traditional methods such as clinical observation, clinical history, and self-questionnaires are effective but they are not available to everyone, are time-consuming and can lead to differing opinions among specialists, presenting challenges. Consequently, innovative approaches are imperative to address these limitations. Artificial intelligence (AI) can serve as a valuable supplement to medicine. AI can simultaneously process multiple data and predict different situations based on input experience and data. The advantages that AI can offer in the medical sciences include aiding in disease management, clinical decision-making, reducing administrative burdens, and more. Additionally, AI can suggest innovative and flexible methods when conventional treatments are impractical. Behavioral intervention technologies (BITs) are a novel service with quick and easy access that can provide cognitive behavioral interventions (CBT), which are effective and convenient solutions and studies have shown that BITs can reduce symptoms of depression and anxiety. Studies have also shown that AI-based tools, such as chatbots, wearable devices, and smartphones, can function more accurately than clinical evaluations by collecting daily information and symptoms, thus aiding mental health treatment. Early diagnosis is pivotal in mental health, AI tools record physiological parameters and analyze data related to the patient's health which enables early and accurate diagnosis of anxiety and depression and facilitates preventive measures and treatment for the patient. Chatbots, through personalized conversations based on expressed emotions, aim to reduce symptoms effectively. In conclusion, AI can offer an innovative, cost-effective, and accessible method of early intervention, treatment and well complement traditional approaches to mental health. Studies demonstrate that it is an effective way to reduce depression and anxiety symptoms by personalized, accessible in a timely manner and a more affordable alternative, ultimately enhancing patient satisfaction on a global scale.

Keywords : artificial intelligence, anxiety, depression

Count: 159
Abstract ID: 542
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

The effects of Transcranial direct current stimulation (tDCS) on anxiety, depression and sleep quality in patients undergoing hemodialysis

Submission Author: Samaneh Farnia

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6. Masters in School Counseling, Faculty of Psychology and Educational Sciences, Allameh Tabatabai University, Tehran, Iran

Background and Aim : This study aimed to evaluate the effects of transcranial direct current stimulation (tDCS) as a non-pharmacological treatment in patients undergoing hemodialysis.

Methods : We conducted a double blind randomized, placebo-controlled trial. Fifty subjects were recruited from hospitals of Sari, Mazandaran, Iran and randomly assigned to either Active-tDCS or to Sham-tDCS. A total of fifteen sessions (3 times a week) was administered to each participant over 5 weeks using a continuous current with an intensity of 2 mA for 20 min. Participants were evaluated by Hospital Anxiety and Depression Scale (HADS) and Pittsburgh Sleep Quality Index (PSQI) questionnaire at baseline, immediately after the 15th session, and at 10 days after the end of intervention.

Results : There were no statistically significant differences in the changes in depression level between the two groups.Results showed that even there had a little reduction in scores of patients with symptoms of depression and anxiety after tDCS (13.35±5.22) in comparison to before that (13.85±5.75), but this reduction wasn't significant. There was a significant difference between the

average score of the experimental group in three periods (before (8.53±3.64), after 15 sessions (5.53±2.8), and 10 days after the end of intervention (4.2±1.84)).

Conclusion : The results suggest that tDCS has had no effects in improving the symptoms of depression and anxiety in hemodialysis patients, while PSQI scales decreased after the intervention and also within 10 days after.

Keywords : Transcranial Direct Current Stimulation, depression, anxiety, hemodialysis.

Count: 160
Abstract ID: 475
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Study protocol: Comparing the effect of tDCS and rhythmic games on major depression patients

Submission Author: Maryam Karami

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3. Department of Sports Psychology, Faculty of Sport Sciences and Health, University of Tehran

Background and Aim : Significant discouragement is a serious mental problem that influences how an individual feels, thinks, and acts. It is described by a diligent and overpowering feeling of misery, sadness, and loss of interest in exercises that used to be charming. Significant wretchedness can likewise cause actual side effects, for example, exhaustion, a sleeping disorder, hunger changes, and torment. Significant discouragement can impede an individual's everyday working and personal satisfaction, and increment the gamble of self destruction. tDCS is a sort of painless mind feeling that applies a feeble electrical flow to the skin that can regulate the action of neurons in the cerebrum. tDCS has been explored as an expected therapy for significant despondency, a serious mental problem that causes constant and extreme misery, sadness, and loss of interest. Rhythmic games are a kind of endlessly interesting games with music, the principal reason for which is to expand kids' engine and interactive abilities. Rhythmic games with melodic backup and cooperation reinforce kids' soul, newness and joy and channel negative energies. These kinds of games make them blissful and fervor by depleting gloomy feelings and making good feelings. The reason for this composing convention is which of the intercessions 1. tDCS 2. Rhythmic games greatly affect the recuperation of patients with significant sadness.

Methods : Incorporation models: In this review, 40 patients with significant sorrow (20 ladies, 20 men) with moderate seriousness were chosen. We isolated the examples into 2 gatherings of 20 individuals (10 ladies, 10 men). The principal bunch: incorporates 20 patients who, notwithstanding drug treatment, are treated with tDCS. The subsequent gathering: incorporates 20 patients who, notwithstanding drug treatment, are treated with musical games. Consideration models: In this review, 40 patients with significant melancholy (20 ladies, 20 men) with moderate seriousness were chosen. We partitioned the examples into 2 gatherings of 20 individuals (10

ladies, 10 men). The primary gathering: incorporates 20 patients who, notwithstanding drug treatment, are treated with tDCS. The subsequent gathering: incorporates 20 patients who, notwithstanding drug treatment, are treated with musical games. Protocol: The main stage: the mediation of ten tDCS meetings two times every day for 5 days with something like 5 hours between two excitements, with a power of 1 milliamp and for 20 minutes. In TDCS, we utilize two channels for excitement and hindrance. 1-The excitatory part in the DLPFC and the inhibitory part in the occipital. 2-The animating part on m1 and the restraining part over the eye hole Second stage: mediation of 10 meetings of musical games (This imaginative game is played with body percussion as well as sticks and glasses.), 1 meeting each day for 10 to 20 minutes as indicated by the patient's condition.

Results : The current study is a kind of the protocol study and now we don't have any results

Conclusion : By including rhythmic games and tDCS in the treatment of patients with major depression, psychologists can help improve their overall quality of life and reduce the burden of physical health problems associated with this disorder.

Keywords : tDCS , rhythmic games , major depression patients , depression

Count: 161
Abstract ID: 373
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Oral

Synergistic Effects of Piperine and Memantine on Reducing the Symptoms of Depression and BDNF Expression in Corticosterone Model of Depression in Amygdala and Hippocampus of Rat Brain

Submission Author: Amin Ataie

Amin Ataie[1]

1. babol university of medical sciences

Background and Aim : Depression is a common psychiatric disorder.There are some studies about anti-depressant effect of piperien. This study is about the synergistic effect of piperine and memantine on behavior improvement and BDNF gene expression in depression model in rat brain.

Methods : In this experimental study, Wistar rats were divided into four groups: Negative control which received no drug, Positive control that received only 20 mg/kg corticosteronei.p., group 3 which received corticosterone+piperine (10 mg/kg, i.p.), and group 4 that received corticosterone + piperine (10mg/kg) + memantine (3mg/kg). After three weeks, the forced swim test for depression, the Plus-Maze test for anxiety and Openfield test for locomotor activity assay were done. Data analysis was carried out by One-way ANOVA and Tukey's test. The study of BDNF gene expression was also performed using Real-time PCR.

Results : The results of water swim test and plus-maze showed a significant difference between corticosterone+piperine+memantine group and corticosterone+piperine($P<0.05$). The gene expression study revealed that increased expression of BDNF occurred in piperine+corticosterone group and piperine+ memantine+corticosterone group compared with coticosterone alone group and piperine+corticosterone+ memantine group compared with piperine+corticosterone group ($P<0.05$)

Conclusion : In current study, piperine and memantine alone and in combination diminished depression and anxiety that also caused increased BDNF expression

Keywords : piperine, depression, corticosterone, memantine

Count: 162
Abstract ID: 270
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Title: The Link Between Post-Traumatic Stress Disorder (PTSD) and Criminal Behavior

Submission Author: Faeze Eskandari

Faeze Eskandari[1], viana yegane[2]

1. PhD student in Psychology, University of Tehran, Kish International Branch
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Introduction: Post-traumatic stress disorder (PTSD) is a prevalent disorder among the prison population, yet its connection to criminal behavior has been understudied. This article aims to review the neurophysiological changes associated with PTSD and their potential link to crime and antisocial behavior. Neurophysiological Changes in PTSD: Individuals with PTSD exhibit several neurophysiological changes. They experience a hyperactive sympathetic nervous system (SNS), an overactive amygdala, a hypoactive hypothalamic-pituitary-adrenal (HPA) axis, and reduced hippocampal volume. These features have been separately associated with aggressiveness and antisocial behavior. Anxiety Disorders and Antisocial Personality Disorder (APD): Approximately 50% of men with APD also have a comorbid anxiety disorder. While it was historically believed that anxiety limited criminal activity and the development of APD, recent evidence suggests that heightened responsiveness to threats may lead to persistent violent behavior. Among male offenders with APD, two-thirds have experienced lifetime anxiety disorders. The Interlink Between Traumatic Experiences and Criminal Behavior: Numerous studies have shown a higher prevalence of PTSD and associated symptoms among offenders compared to the general population. However, specific trajectories connecting trauma, PTSD, and criminal behavior are rarely explored. It is worth noting that the relationship between anxiety disorders and crime is confirmed in male patients but not in female patients. The Role of Trauma in Criminal Behavior: Exposure to chronic and long-term violence can create a dysfunctional cycle within families and communities, where victims of violence may later become perpetrators. Trauma acts as a constant factor that influences the multifaceted expression of violence. Conclusion: This article highlights the connection between PTSD and criminal behavior, shedding light on the neurophysiological changes associated with PTSD and their potential impact on aggression and antisocial behavior. The interlink between traumatic experiences, PTSD, and criminal behavior emphasizes the need for further research and understanding in this field. Recognizing the role of trauma in criminal behavior can contribute to the development of effective interventions and support systems for individuals affected by PTSD in the criminal justice system.

Keywords : Anxiety;PTSD;criminal behavior;psychology

Count: 163
Abstract ID: 533
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Oral

Investigating the effectiveness of transcranial direct electrical stimulation on the electroencephalography pattern Quantification and symptoms of patients with OCD

Submission Author: Mohammadreza Gholipourfallahy

Mohammad Reza Gholipour fallahy[1]

1. Ph.D. student of Cognitive Neurosciences, University of Tabriz

Background and Aim : The purpose of the present study is to investigate the effectiveness of transcranial direct electrical movement on the electroencephalography pattern The number and symptoms of patients with obsessive-compulsive disorder were In this experimental research with a pre-test plan- Post-test with the control group, patients with obsessive-compulsive disorder to psychiatric clinics and The psychology of Tabriz city in 1401-1400 30 patients in the way of achieving and using the goal of selection and in the form of they were randomly assigned to experimental and control groups.

Methods : After diagnosing obsessions in patients using From the research version of the structured clinical interview and quantitative electroencephalographic pattern recording from 19 sites The brain in the experimental group was determined based on the quantitative pattern of electroencephalography of each person, and the treatment protocol was determined The group was treated with direct transcranial electrical movement (20 sessions of 30 minutes). The participants were quantitatively evaluated with the Yale-Brown Obsessive Compulsive Test and recording the electroencephalography pattern on two occasions (pre-test and post-test)

Results : The obtained data were analyzed using covariance and dependent t tests .

Conclusion : the results showed that Transcranial direct electrical stimulation is effective in improving the symptoms of people suffering from obsessive compulsive disorder and correcting the brain wave pattern of patients. Therefore, I can use this method as a therapeutic treatment without complications

Keywords : Obsessive-compulsive disorder, quantitative electroencephalography, transcranial direct electrical stimulation

Count: 164
Abstract ID: 36
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Poster

Predicting the Relapse of Obsessive-Compulsive Disorder Based on the Physical-Psychological Components of Corona Anxiety and Emotional Self-Regulation in Patients with Obsessive-Compulsive Disorder

Submission Author: Behzad Behrouz

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2. PhD student, Department of Psychology, General Psychology, Islamic Azad University, Tonekabon Branch, Tonekabon, Iran.

Background and Aim : Obsessive illness is one of the severe problems and disorders, the cause of which is challenging to recognize and treat. Therefore, the research was conducted with the aim of predicting the relapse of obsessive-compulsive disorder based on the physical-psychological components of corona anxiety and emotional self-regulation in patients with obsessive-compulsive disorder.

Methods : The research method was descriptive-correlation. Among the women suffering from obsessive compulsive disorder who referred to Parham Clinic in Tehran in 2023, 200 people were selected using the available sampling method and obsessive-compulsive questionnaire (Hodgson and Rachman, 1977), corona anxiety (Alipour et al., 2018) and emotional self-regulation (Gross and John, 2003) they completed. Data analysis was done with the methods of descriptive statistics, Pearson correlation coefficient and multivariate regression with the help of SPSS version 26 statistical software.

Results : The results showed that corona anxiety ($r=0.29$ and $p=0.014$) and its components have a positive and significant correlation with the recurrence of obsessive-compulsive symptoms ($p<0.05$). Also, emotional self-regulation ($r=-0.48$ and $p=0.018$) and its dimensions were able to negatively and significantly predict the recurrence of obsessive-compulsive symptoms. Regression analysis using the simultaneous method also showed that predictor variables together predicted 31% of the variance of recurrence of obsessive-compulsive symptoms.

Conclusion : Considering these results, it seems that by improving emotional self-regulation and controlling the anxiety of Corona, it is possible to reduce the recurrence of obsessive-compulsive symptoms in these patients.

Keywords : obsessional symptoms: corona anxiety; emotional self-regulation.

Count: 165
Abstract ID: 655
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Poster

Enhancing Cognitive Flexibility And Providing Relief From Obsession: tDCS As A Novel OCD Treatment

Submission Author: Seyedmohammadsaeid Saeid

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Background and Aim : Obsessive-compulsive disorder (OCD) is a disorder in which a person experiences uncontrollable and recurring thoughts (obsessions), engages in repetitive behaviors (compulsions), or both. Symptoms of OCD characterized by maladaptive patterns of repetitive, inflexible cognition and behavior that suggest a lack of cognitive flexibility.

Methods : The design of this study is a pre-post test of an experimental group. The sample of this study consists of 15 obsessive-compulsive patients who received tDCS to improve their symptoms.The inclusion criteria for participants consisted of having a clinically significant Yale-Brown questionnaire score (above 16) and not having any electrical devices or skin irritability; however, we excluded 5 participants due to their absence during their treatment course. The research instruments consisted of a tDCS device for providing electrical stimulation. The tDCS protocol was a new design that placed the anode electrode on Fz (Motor area) and the cathode electrode on Fp1 (Left supraorbital region) based on 10-20 EEG system. The tDCS sessions were conducted three times a week for a total of 20 sessions, with an intensity of 2 milliamperes in 20 minutes. The hypothesis of this protocol aims to enhance the activity of motor cortex in order to reduce OCD symptoms by improving cognitive flexibility. To assess pre-post intervention changes, we used the “Rey–Osterrieth complex figure” test (to evaluate immediate and delayed spatial memory), “Corsi block span” test (to evaluate spatial working memory), design fluency test of the Delis-Kaplan Executive Function System (to evaluate cognitive flexibility), DASS-21

questionnaire (to evaluate stress, anxiety, and depression), and the Yale-Brown questionnaire (to evaluate obsession and compulsion symptoms). Data analysis involved paired t-tests.

Results : The findings indicated that tDCS stimulation was statistically significant in its effectiveness on flexibility (MD: -2.2, t: -11, p=0.000), obsession (MD: 5.14, t: 4.13, p=0.006), and depression (MD: 12.00, t: 3.7, p=0.019), but it did not exhibit a significant impact on immediate spatial memory (MD: -3.4, t: -1.38, p=0.22), delayed spatial memory (MD: -1.75, t: -0.96, p=0.37), spatial working memory (MD: -0.7, t: -1.87, p=0.13), stress (MD: 6.00, t: 1.79, p=0.14), anxiety (MD: -4.00, t: -0.7, p=0.47), or compulsion symptoms (MD: 2.28, t: 1.34, p=0.22).

Conclusion : In this study tDCS was investigated as a potential treatment for OCD. The findings revealed that tDCS had a significant positive impact on cognitive flexibility, obsession, and depression in OCD patients. The observed improvement in cognitive flexibility is particularly noteworthy, as deficits in cognitive flexibility are a common feature of OCD and can significantly impair daily functioning. The tDCS protocol, which targeted the motor cortex, appears to have a beneficial effect on this aspect of executive functioning. This finding aligns with the hypothesis that enhancing motor cortex activity can lead to reduced OCD symptoms, possibly by influencing neural pathways related to cognitive flexibility. the significant reduction in obsession and depression indicates that tDCS have a broader impact on the emotional and psychological well-being of OCD patients. These improvements can potentially lead to a better overall quality of life for individuals struggling with this challenging disorder.

Keywords : tdcs, ocd, cognitive functions.

Count: 166
Abstract ID: 163
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

A Narrative Review of the Efficacy of rTMS Intervention in Cannabis and Methamphetamine Use Disorders

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Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive brain stimulation technique, which can alter the focally cortical excitability of brain regions, influence neuronal plasticity, and modify neural connections. rTMS is possible to derive a therapeutic benefit in substance use disorders. There are currently no FDA-approved medications for either cannabis and methamphetamine use disorders. The evidence-based psychological treatments primarily focused on managing symptoms and enhancing motivation that have resulted in moderate effects. recent studies are aimed at employing supplementary therapeutic approaches like rTMS. The purpose of this study was to review scientific literature about the rTMS efficacy and its technical and methodological considerations in the field of cannabis and methamphetamine use disorder. We chose eligible articles that were conducted as randomized clinical trials from the PubMed database. The eligible studies were reviewed by two researchers. limited number of articles specifically addressed the efficacy of rTMS in cannabis users, whereas most articles have concentrated on the efficacy of rTMS in methamphetamine users. Most studies on the efficacy of rTMS in methamphetamine use disorder (MUD) were conducted on Chinese samples and studies in cannabis users were conducted on American samples. There was not a significant reduction in cue-elicited craving in heavy cannabis users after a single session of rTMS applied Left DLPFC (10 Hz, 110% rMT, 4000 pulse). Participants who received active rTMS (Beam-F3, 10Hz) reported numerically, but not significantly, more weeks of abstinence cannabis use in the follow-up period. The results of rTMS efficacy on methamphetamine use disorder are heterogeneous. Some studies have indicated that high-frequency rTMS applied DLPFC reduce craving in MUD. Furthermore, active rTMS improved verbal learning, memory, social cognition, and decision-making ability in methamphetamine users. The efficacy of low-frequency rTMS had different results. The results of one study showed that low-frequency rTMS either at left or right DLPFC was effective in decreasing the cue-induced craving for methamphetamine. Another study indicated that real 1Hz rTMS over the left DLPFC increased self-reported craving as compared to sham stimulation. The

exploration of the optimized protocol study showed that involving the ventromedial prefrontal cortex (vmPFC) with continuous theta-burst stimulation (cTBS) was the optimized protocol and well-tolerated for methamphetamine dependent individuals. There were heterogeneous results about the efficacy of rTMS for cannabis and methamphetamine use disorders due to varying study results and diverse protocols. rTMS can be safely and feasibly delivered for cannabis and Methamphetamine use disorders. Small sample sizes, varied protocols and study duration, and lack of follow-up periods were among the limitations of the eligible studies. Future studies should aim to explore the specific neural mechanisms responsible for the effects of rTMS in substance use disorders.

Keywords : Repetitive transcranial magnetic stimulation (rTMS); Methamphetamine; Cannabis; Craving; Substance use disorder

Count: 167
Abstract ID: 420
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

Reward processing and risk preferences: an event related potential study

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Background and Aim : Inter-individual variability in risk preferences can be reflected in reward processing differences, making people risk-seeker or risk-averse. However, the neural correlates of reward processing in risk preferences are yet unclear. The current event-related potential (ERP) study investigated and compared electrophysiological correlates associated with different stages of reward processing in risk-seeking and risk-averse groups.
Methods : The current event-related potential (ERP) study investigated and compared electrophysiological correlates associated with different stages of reward processing in risk-seeking and risk-averse groups. Individuals performing lower and upper 20% of the score on the Balloon Analogue Risk Task (BART) were considered risk-averse (n=15) and risk seekers (n=16), respectively. They performed a gambling task during EEG recording.
Results : Behaviorally, there were no significant differences between groups. Low-risk option elicited relatively blunted stimulus-preceding negativity (SPN) response in risk seekers compared to risk averse, during the anticipation stage. Feedback-related negativity (FRN), during the outcome stage, was enhanced in response to greater losses in risk seekers but not in risk averse. Results also showed a significant decrease of P300 amplitude in risk seekers compared to risk-averse after receiving the greater loss.
Conclusion : These findings suggest that ERP components can detect differences in reward processing during risky situations. In addition, the results indicated that motivation and cognitive control with their related brain areas may have a central role in reward-based differences between the two groups.
Keywords : risk preferences, reward processing, ERP, reward anticipation, reward outcome.

Count: 168
Abstract ID: 606
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

The Effects of Psilocybin on Patients with Cancer: A Systematic Review and Meta-Analysis

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Background and Aim : -Psilocybin, a potent natural hallucinogen recognized for its activation of 5-HT2A receptors, demonstrates promise as a therapy, particularly for cancer patients experiencing psychological distress. This underscores the demand for efficient treatments. The review's objective is to scrutinize contemporary data and execute a meta-analysis to evaluate the effectiveness and safety of psilocybin for cancer patients.

Methods : -Six electric databases (PubMed, Scopus, PsycINFO, Web of Science, Cochrane and CINAHL Complete) were searched for records in English. Studies that measure the effect of psilocybin on patients with cancer were included. The Cochrane Collaboration’s tool was used to assess the quality of the included studies. A random-effect model was preferred and statistical analysis was performed by Stata software version 17.

Results : -From 924 initial articles, seven studies were chosen, involving adult US patients. These studies included three Randomized controlled trial (RCT), two non-randomised studies, and two long-term follow-ups of previous research. In the RCT analysis, 43 participants showed no reduction in depression (-3.02 [-6.74, 0.7]) but a reduction in anxiety (-7.5 [-13.25, -1.74]). In the

non-randomised studies analysis with 102 participants, depression didn't change significantly, but anxiety decreased significantly (-2.57 [-4.63, -0.51]), and spiritual well-being significantly increased (2.2 [0.35, 4.05]). Six of the seven studies reported no serious adverse events with psilocybin, with common minor side effects including increased blood pressure, heart rate, headache, anxiety, nausea, and psychological discomfort.

Conclusion : Psilocybin shows promise in alleviating depression and anxiety in cancer patients, with potential for fostering acceptance and connection. Further research is crucial to refine its effectiveness and explore combination therapies. Study limitations warrant comprehensive research into its potential for alleviating cancer-related psychological distress

Keywords : Psilocybin, Cancer, Psychotherapy, Psychedelic

Count: 169
Abstract ID: 168
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Methamphetamine alters local efficiency analysis of resting–state functional brain network

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Background and Aim : The drugs of abuse may affect functional connectivity (FC) extracted from graph theory; however, there has been little discussion about local efficiency of FC in methamphetamine (MA) users. This study, therefore, set out to assess resting–state FC (rs-FN) and graph theory–based local efficiency within the left and right hemispheres of MA abusers.

Methods : Functional brain networks of 19 MA abusers and 21 control participants were analyzed using resting–state fMRI. Graph edges in functional networks of the brain were defined and recurrence plot were used. Using the automated anatomical labeling (AAL) atlas, those brain regions which are highly affected by drugs of abuse were considered as the nodes of functional connectivity graph.

Results : We found that MA abuse may be accompanied by alterations of rs-FN within the default–mode network (DMN), executive control network (ECN), and the salience network (SN) in both hemispheres of the brain. We also observed that such effects of MA may be correlated with duration of MA abuse and abstinence in many components of the DMN and SN.

Conclusion : The results would seem to suggest that MA–induced increases of local efficiency may, in part, account for maladaptive decision making, deficits in executive function and control over drug seeking/taking, and relapse.

Keywords : Methamphetamine; local efficiency; functional connectivity; graph theory; recurrence plot.

Count: 170
Abstract ID: 449
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

The effects of gut microbiota on drug addiction

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Drug addiction is a global problem that affects not only individual lives but also society. The current addiction crisis initially began with the overprescription of drug analgesics. Addiction is a persistent and recurrent brain defect caused by chronic substance abuse. Nowadays, the development of new therapeutic strategies for the treatment of substance dependence is essential, and studies on the gut microbiome as one of the factors related to these disorders are progressing. The communication between the brain and the gut is bidirectional and is carried out through the brain-gut microbiota axis. This axis includes various factors, including the immune system, microbiota metabolites, vagus nerve, and intestinal hormones. Growing evidence suggests that among these factors, the microbiota, a key regulator of gut-brain function, modulates host homeostasis through the gut-brain microbiota axis. Over the last few centuries, lifestyle, diet and medical care have changed the health of gut microbes. A condition in which the population structure of microbes is disrupted is called dysbiosis, usually caused by disease or medication. Correlations have been shown between microbiome changes and addiction, as well as disorders commonly associated with addiction, such as anxiety, depression, pain, and stress. The presence of a structurally diverse microbiota naturally present in the gut is essential for brain growth and development as well as the release of neurotransmitters such as dopamine, GABA, and serotonin, and can influence behavior and cognition. The release of these neurotransmitters, especially dopamine, in the mesocorticolimbic reward system plays an important role in drug addiction, and changes in the structural diversity of gut microbiota cause changes in dopamine release in the frontal cortex, hippocampus, and striatum. Examination of microbiota changes shows that nicotine increases the response of dopaminergic neurons in the posterior ventral tegmental area and reduces cocaine-induced locomotor activity and conditioned place preference (CPP) in rats. Depletion of intestinal bacteria attenuates naloxone-induced morphine withdrawal in morphine-dependent rats and prevents the development of chronic tolerance to morphine-induced analgesia. Decreasing gut

microbiota has been shown to reduce alcohol consumption, prevent methamphetamine-induced CPP formation in rats and reduce fentanyl and oxycodone self-administration. Overall, these findings suggest that altering the microbiota may impact addiction by affecting the brain and altering mesocorticolimbic neurotransmitters. Further studies in this context can help to know the effective factors and mechanisms of drug addiction and identify its treatment.

Keywords : Gut microbiota, Drug addiction, Dysbiosis, Mesocorticolimbic, Dopamine

Count: 171
Abstract ID: 504
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Effect of Nicotine Abstinent in Parents on Anxiety Behavior of The First Generation of Male Rats

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Background and Aim : Research has shown that drugs that contain narcotic and addictive compounds can cause harmful effects on a person, and we have shown in this research that the harmful effects of drugs and compounds are effective on the children of the next generation. Anxiety disorders can develop following a single traumatic event or a highly stressful period. Although different disorders under the anxiety disorder umbrella are defined by different symptoms, they are often characterized by an exaggerated fear response to cues and contexts that are not dangerous. The aim of this study was investigating the effect of nicotine abstinent on anxiety behavior of the male offspring which assessed by elevated plus-maze (EPM) test.

Methods : In this study, nicotine was administrated to male and female rats over 30 days (1mg/kg/twice a day), following 10 days wash-out period. Then, male and female rats were mated and offspring of them were divided into four group: control, maternal nicotine exposure (MNE), paternal nicotine exposure (PNE) and maternal and paternal nicotine exposure (MNE+PNE). EPM test was done on 60-days old offspring

Results : Data reported that open arm time decreased in MNE, PNE and MNE+PNE groups in comparison to control group ($P<0.001$ for all groups). Open arm time increased in PNE and MNE+PNE groups compared to MNE group ($P<0.05$). Analysis of results showed that open arm

entries decreased in MNE, PNE and MNE+PNE groups in comparison to control group ($P<0.001$ for all groups). Locomotion results of this study displayed no statistical difference among experimental groups ($P>0.05$).

Conclusion : Nicotine has been shown to have effects on anxiety and depression in both human and animal studies. These studies suggest that nicotine usage in abstinent parents can modulate anxiety behavior in male offspring.

Keywords : Nicotine, Anxiety, Male Rats, Offspring

Count: 172
Abstract ID: 135
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

Dose-dependent relationship between diurnal cortisol rhythm and delay discounting in cannabis users: A matched pair case-control study

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Background and Aim : Evidence for a different activation profile of the hypothalamic-pituitary-adrenal (HPA) axis and its interaction with the endocannabinoid system and the reward system (delay discounting) in different time-dependent periods and tetrahydrocannabinol (THC) doses is not certain.
Methods : This study has a matched pair case-control design with multiple control groups. Residual sampling was adopted to select two hundred sixty-four participants, who were divided into three groups, including low dose group, medium dose group, and high dose group, and three abstinence groups, using an optimal matching algorithm. Urine and saliva specimens were analyzed using gas chromatography mass spectrometry and electrochemiluminescence.
Results : There was a direct relationship between THC with the area under the curve and the cortisol awakening response in low dose group. The relationship was inverse in medium dose group and high dose group. In all three groups, the diurnal cortisol slope declined as THC and delay discounting increased. A significant cortisol spike was observed in high dose group at wake up + nine h. A significant difference was noticed between abstinence groups and cannabis users in the area under the curve, cortisol awakening response, diurnal cortisol slope (except in medium dose group) and delay discounting indicators.
Conclusion : The failure of THC levels to affect cortisol reactivity indicators in medium dose group and the significant afternoon cortisol spike in high dose group are scientific challenges in understanding the exact THC mechanism in suppressing or stimulating the HPA axis that require further investigation.
Keywords : Hypothalamic-pituitary-adrenal (HPA) axis, Tetrahydrocannabinol, Delay discounting, Cortisol, Cannabis

Count: 173
Abstract ID: 395
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Comparison of cognitive functions and drug craving in women and men under maintenance treatment with methadone and buprenorphine

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Background and Aim : Maintenance treatment with methadone and buprenorphine is used as the most widely used drug treatment for opioid use disorders around the world and in our country. Cognitive functions include a set of neurocognitive functions that play an important role in the continuation of treatment, preventing craving and patient relapse. Although many studies have addressed the effects of drug use and maintenance treatments on cognitive functions in men, few studies have been designed and implemented on the cognitive functions of female addicts and their comparison with men. This research was conducted with the aim of evaluating and comparing cognitive functions in men and women under maintenance treatment with methadone and buprenorphine.

Methods : This study is of Ex-Post Facto research. For data gathering, 60 addicted people who were under maintenance treatment with methadone and buprenorphine in Semnan drug addiction treatment outpatient clinics, were selected by available sampling method. They were divided into 4 groups (men× methadone or boprenorphine and women× methadone or boprenorphine). Cognitive flexibility, cognitive abilities and substance craving questionnaires were used to collect data. Data were analyzed using multivariate analysis of variance test.

Results : According to the statistical analysis, there is no significant difference between men and women undergoing maintenance treatment with methadone in terms of cognitive flexibility, cognitive abilities and substance craving. There is no significant difference between men and women undergoing maintenance treatment with buprenorphine in terms of cognitive flexibility, cognitive abilities and substance craving. Also, there is a significant difference in terms of cognitive flexibility, cognitive abilities and substance craving in addicts undergoing maintenance

treatment with methadone and buprenorphine in both men and women, so that people under maintenance treatment with buprenorphine obtained better grades.

Conclusion : Maintenance treatment with methadone and buprenorphine has similar results in women and men with a history of substance use. Maintenance treatment with buprenorphine also has better results compared to methadone on cognitive functions and craving in people under treatment.

Keywords : buprenorphine. neurocognitive.treatment

Count: 174
Abstract ID: 331
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Transcranial Direct cranial current stimulation (tDCS) in behavioral and Internet addiction : A review of efficacy, technical, and and methodological issues

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Objective:Transcranial Direct current cranial stimulation (tDCS) has been applied as a technique in the field of behavioral therapy. In this article, the articles and researches conducted in this field are discussed in order to examine the issues related to Transcranial cranial direct current (tDCS), its methodology and effectiveness for behavioral and behavioral therapy with the Internet. Method: 15 articles were selected from among 67 available articles, 3 articles were related to the effect of Transcranial direct cranial current on the Internet and 12 articles were about the effect of Transcranial direct cranial current stimulation (tDCS) on behavioral behaviors. Findings: The results showed that transcranial brain movement using direct electric current (tDCS) has a significant effect on behavioral inhibition of students with personality type A and behavioral activation with personality type B. Conclusion: It is not yet possible to definitively comment on the effectiveness of tDCS as a multi-treatment in behavioral and Internet-based behavioral therapy. Small samples of different protocols and the length of the study period and lack of follow-up from the original studies, but it can be used as a complementary treatment.

Keywords : Transcranial direct cranial current stimulation (tDCS), Behavioral addiction, Internet addiction

Count: 175
Abstract ID: 482
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Evaluation of nicotine effects on depression-like behaviors in male offspring of paternal and/or maternal nicotine exposed Wistar rat.

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Background and Aim : Drug addiction is an important concern in the world. Reports demonstrate that substance use disorder could influence genetic and environmental factors, and children of addicts have a higher rate of psychopathology. Depression has become one of the most severe psychiatric disorders and endangers the health of living beings all over the world. Depression leads to morbidity, and has an incidence that ranges from 13.3% to 17.1% in the United States. A mild depression episode manifests as sadness, anhedonia, and a feeling of worthlessness, whereas the severe condition is classified by a recurring intention to commit suicide. Clinically, with the unclear pathological mechanism and the inconsistent therapeutic effects, depression is considered to be a heterogeneous disease. The goal of this study was investigating the effect of nicotine abstinence on depression-like behaviors of the male offspring, which was assessed by Forced Swim Test (FST).

Methods : In this study, male and female Wistar rats were used. All were administrated with nicotine over 30 days (1mg/kg/twice a day), following a 10 days wash-out period. Offspring of them were used in three distinct groups: maternal nicotine exposure (MNE), paternal nicotine

exposure (PNE) and maternal and paternal nicotine exposure (MNE+PNE). The FST test was done on 60-day-old offspring.

Results : Data showed that immobility time in the force swimming test (FST) increased in the MNE group compared to the control group ($P<0.001$). Also, immobility time was enhanced in the PNE group in comparison to the control group ($P<0.001$). Immobility time in FST increased in the MNE+PNE group compared to the control group ($P<0.001$).

Conclusion : Nicotine has been shown to have effects on depression in both human and animal studies. These studies suggest that nicotine usage in abstinent parents can modulate depression in male offspring.

Keywords : Depression; Addiction; Nicotine; FST

Count: 176
Abstract ID: 596
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

The Diagnostic Significance of the Neutrophil to Lymphocyte Ratio (NLR) in Cannabis Users: A Systematic Review and Meta-Analysis

Submission Author: Reza Moshfeghinia

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Introduction: Cannabinoids, both natural and synthetic, are a subject of scientific interest. Cannabis is widely used, and its impact on health and the immune system is being studied. The endocannabinoid system influences inflammation, including the Neutrophil to Lymphocyte Ratio (NLR), which is a potential diagnostic tool. Our study investigates the connection between cannabis use and NLR. Methods: Our systematic review was registered in Prospero (#CRD42023463539). We searched six databases (PubMed, Scopus, Embase, PsycINFO, Web of Science, and CINAHL Complete) for records in English from inception to February 10, 2023. We included observational studies that measured the Neutrophil-to-Lymphocyte Ratio (NLR) in cannabis users and control participants. We used the Newcastle–Ottawa Quality Assessment Scale to assess the quality of the included studies. We selected a random-effects model, and the statistical analysis was performed using Stata software version 17. Results: Out of a total of 3,902 records, only five articles were selected for inclusion in the meta-analysis. All of these chosen studies utilized a retrospective design. Furthermore, it's worth noting that all of the studies included were of high quality, and based on the GRADE approach, the level of certainty in the evidence was considered moderate. The analysis revealed a statistically significant difference in the NLR between cannabis users and the control group, with cannabis users having a higher NLR (WMD: 0.41 [0.13, 0.69], I2: 0.00%). Additionally, there was no evidence of publication bias in these studies. The analysis also extended to other markers, indicating that only the neutrophil count (WMD: 0.66 [0.25, 1.12]), white blood cell count (WBC) (WMD: 1.17 [0.56, 1.78]), and monocyte count (WMD: 0.11 [0.05, 0.16]) were found to be higher in cannabis users when compared to the control group. Conclusion: Our systematic review and meta-analysis reveal that cannabis use may affect NLR and hematologic parameters, suggesting a potential immune impact. Complex associations exist, requiring further research. Schizophrenia and pro-inflammatory factors are

discussed, highlighting the need for ongoing investigation into cannabis-related immune changes and mental health.

Keywords : Neutrophil to Lymphocyte Ratio, NLR, Cannabis.

Count: 177
Abstract ID: 532
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

In the Congress 60, how are the interactions of neural structures, worldview and psyche considered for the purpose of treating drug abusers? Theory based on reality

Submission Author: Ali Rashidian

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Background and Aim : Various theories have been proposed to treat addiction. These theories have emphasized the biological, psychological, and social aspects of addiction. So far, the theory that has considered all dimensions of addiction and led to effective and useful interventions has not been formed. One of the organizations that considered physiological, psychological, and social aspects as a whole unit is the Congress 60. In this study, the interaction of neural structures, worldview, and psyche in the treatment of drug users in Congress 60 is presented

Methods : Grounded theory methodology based on critical realism was used to arrive at this theory. The data of the study included people treated from the Congress 60, texts, meetings, images, allegories and metaphors that were collected through interviews (15 people), observation and notes in the field (more than 1000 hours of attendance at the centers of the Congress 60), investigation Texts (13 texts), CDs (40 CDs) available in the Congress 60 were obtained. These data were obtained from the representatives of the Congress 60 across the country between 2021 and 2023. The analysis of these data was based on the recommended continuous comparison method of Strauss and Corbin 2014 using MAXQDA 2020 software.

Results : The core concept obtained is to Crossing the Minus -60? Zone. The main categories include: "Changes in neural structures related to addiction", "Changes in addictive worldview" and "Changes in the user's psyche". The subcategories include the formation of addictive neural structures, the formation of restored neural structures, the formation of an addictive worldview, the formation of a treatment worldview, the abuser's psyche, and the psyche of the treated person.

Conclusion : Addiction treatment in the Congress 60 has been likened Crossing the Minus -60° Zone. In order to overcome addiction, changes must be made in the three components of physical structures, the person's addictive worldview, and the user's psyche, so that the person can get treatment. Opium Tincture medicine is used to treat the body in the Congress 60. This drug is used in a reverse manner in the context of time and reaches zero in 11 months. Simultaneously with the changes in the body, the two components of light and positive sound are used together with healthy thinking and experience in order to change the worldview of the drug abuser. With changes in the consumer's body and worldview; The psyche that is driven by these two components goes towards becoming healthy.

Keywords : Addiction, Congress 60, Theory

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Presentation Type: Poster

How will the neural structures of drug abuser change in the Congress 60? A grounded theory study

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Background and Aim : Addiction is one of the problems that humans face. Many theories have been proposed to treat the biological aspects of addiction, but despite these theories, addiction is still one of the problems of humanity. For this reason, there is a need for a new paradigm that provides a new perspective on addiction. One of the organizations that seems to have proposed a new paradigm in the biological dimensions of addiction is Congress 60. However, this paradigm has not been fully investigated in research. This study seeks a deep understanding of the processes in the underlying paradigm of this organization for the biological dimensions of addiction.

Methods : Grounded theory methodology based on critical realism was used to arrive at this theory. The data of the study included people treated from the Congress 60, texts, meetings, images, allegories, and metaphors that were collected through interviews (15 people), observation and notes in the field (more than 1000 hours of attendance at the centers of the Congress 60), investigation Texts (13 texts), CDs (40 CDs) available in the Congress 60 were obtained. These data were obtained from the representatives of the Congress 60 across the country between 2021 and 2023. The analysis of these data was based on the recommended continuous comparison method of Strauss and Corbin 2014 using MAXQDA 2020 software.

Results : The core concept obtained is changes in body structures related to addiction. The main categories include: "Destruction of drug abuser neural structures", Reconstruction of neural structures in the Congress 60", "Expert's Guide" and "Balance of neural structures after treatment".

Conclusion : The core concept obtained is changes in body structures related to addiction. The main classes include: "Destruction of drug abuser neural structures", Reconstruction of neural structures in the Congress 60", "Expert's Guide" and "Balance of neural structures after treatment".

Keywords : Addiction, Congress 60, Neural Structures

Count: 179
Abstract ID: 206
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Role of Glucocorticoid and Mineralocorticoid receptors of the dorsal striatum in morphine-induced conditioned place preference (CPP) and expression of dopamine transporter in male adult rats

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Background and Aim : Morphine is an addictive drug that overstimulates brain reward system by inhibiting GABAergic neurons and increases the amount of dopamine in different areas including the dorsal striatum. It can also induce conditioned place preference. Studies show that glucocorticoid hormones increase to stress levels during morphine addiction. Receptors of these hormones (MR and GR) exist on dopaminergic neurons. These receptors exert their effects through genomic and nongenomic pathways. They affect the amount of dopamine in synaptic cleft and play an important role in the tendency for drugs. One of the possible mechanisms of the effect of MR and GR on dopamine levels can be through dopamine transporters (DAT). We investigated the interaction between these receptors and DAT in the dorsal striatum.

Methods : The study was conducted on 120 male Wistar rats. They were placed in control and treatment groups. The cannula was placed in the dorsal striatum and morphine dependency was assessed through conditioned place preference (CPP) which consists of habituation, pre-conditioning, conditioning and test phases. A week after stereotaxis surgery, all rats were placed

in CPP. It has three chambers, including A, B and C. Rats received morphine or saline in A and B and the time spent in these chambers are recorded on pre-conditioning day. On the conditioning day, morphine was injected subcutaneously at a dose of 10 mg/kg. Control groups received spironolactone and RU38486 in doses of 10 and 100 ng/µl, corticosterone 10 ng/µl, and 5% DMSO into dorsal striatum 30 minutes before saline. Treatment groups received the same doses 30 minutes before morphine. On the test day, the CPP score was evaluated and brain samples were obtained for immunohistochemistry.

Results : Morphine induced conditioned place preference. Glucocorticoid and mineralocorticoid receptors play a major role in morphine dependency in CPP model. DAT expression went through changes during morphine dependency and receiving treatments. Corticosterone had an inhibitory effect on CPP score and increased dopamine transporter protein during morphine addiction in dorsal striatum.

Conclusion : Morphine can induce CPP. Inhibiting glucocorticoid and mineralocorticoid receptors in dorsal striatum decreased the CPP score in test day; as long as increasing the amount of DAT in synaptic cleft. It can be said that morphine induces CPP through MR and GR and one of the possible mechanisms is changing the concentration of DAT. Surprisingly, corticosterone decreased CPP score and increased DAT in this area; revealing that both stimulation and inhibition of glucocorticoid and mineralocorticoid receptors attenuate the effect of morphine.

Keywords : Glucocorticoid receptors; Mineralocorticoid receptors; DAT; Dorsal striatum; Morphine; Corticosterone

Count: 180
Abstract ID: 555
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Role of Glucocorticoid and Mineralocorticoid receptors of the mPFC in morphine-induced conditioned place preference (CPP) and expression of dopamine transporter (DAT) in male adult rats

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Background and Aim : Morphine induces conditioned place preference, but the mechanisms and the sites of its action are not completely clear. In general, addictive drugs target the brain reward system, leading to euphoria and dependence through dopamine-enhancing mechanisms. New studies show that glucocorticoids have receptors on dopaminergic neurons involved in reward and play an important role in the drug use and reinstatement. The prefrontal cortex is part of the reward circuit in the forebrain and has strong connections and interactions with different parts of the brain in many complex behaviors associated with substance abuse. The medial prefrontal cortex (mPFC) is considered an important part for cellular and molecular plasticity in addiction, and its anatomical and functional connections with other areas show that while it affects the mesocorticolimbic dopamine system, it also has a great effect on its dopamine levels. Glucocorticoid hormones in addiction reaches to the stress concentration and affects the reward system through its receptors and changes the amount of dopamine. One of the possible mechanisms of the effect of these hormones on the amount of dopamine is through controlling the amount of dopamine transporter protein (DAT) in the synaptic cleft. In our study, we investigated the interaction between

glucocorticoid hormones and the level of dopamine and its transporter in mPFC in the conditioned place preference model.

Methods : The study was conducted on 120 male Wistar rats. They were placed in control and treatment groups. The cannula was placed in mPFC and morphine dependency was assessed through conditioned place preference (CPP) which consists of habituation, pre-conditioning, conditioning and test phases. A week after stereotaxis surgery, all rats were placed in CPP. It has three chambers, including A, B and C. Rats received morphine or saline in A and B and the time spent in these chambers are recorded on pre-conditioning day. On the conditioning day, morphine was injected subcutaneously at a dose of 10 mg/kg. Control groups received spironolactone and RU38486 in doses of 10 and 100 ng/µl, corticosterone 10 ng/µl, and 5% DMSO into mPFC 30 minutes before saline. Treatment groups received the same doses 30 minutes before morphine. On the test day, the CPP score was evaluated and brain samples were obtained for immunohistochemistry.

Results : Morphine induced conditioned place preference. Glucocorticoid and mineralocorticoid receptors play a major role in morphine dependency in CPP model. DAT expression went through changes during morphine dependency and receiving treatments. Corticosterone did not affect CPP score and dopamine transporter protein during morphine addiction in mPFC.

Conclusion : Morphine can induce CPP. Inhibiting glucocorticoid and mineralocorticoid receptors in mPFC decreased the CPP score in test day; as long as increasing the amount of DAT in synaptic cleft. It can be said that morphine induces CPP through MR and GR and one of the possible mechanisms is changing the concentration of DAT. Surprisingly, corticosterone did not show any inhibitory or synergic effect on CPP score, as well as DAT concentration in mPFC tissue. As a result, inhibition but not stimulation of glucocorticoid and mineralocorticoid receptors attenuates the effect of morphine in mPFC.

Keywords : Morphine; Glucocorticoid; Mineralocorticoid; Conditioned place preference; Dopamine; Large laboratory rat

Count: 181
Abstract ID: 234
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Relationship of interoceptive attention with substance use disorder: A narrative review

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Attention (IA) is a thought-provoking construct in connection with substance use disorder (SUD) theories, and limited empirical evidence has been shown. This review aims is to investigate the relationship between IA and SUD, provide a summary of the current knowledge on this topic, identify gaps in understanding, and propose directions for future research. The term " IA" refers to the ability to sense and perceive the internal state of our body, including sensations related to heartbeat, respiration and digestion. IA encompasses some processes including acquiring, processing, and integrating bodily signals with external stimuli to affect the ongoing motivated behavior. IA is believed to be disrupted as a result of substance use disorders. Substance abuse further can have a damaging effect on the balance between interoception and exteroception. It can cause an individual to become excessively focused on external stimuli, while reducing their ability to perceive internal bodily sensations. The findings of a study indicated a decrease in IA in addicted patients in comparison to healthy controls, which may provide support for the hypothesis that awareness of the interoceptive processes may be disturbed in addiction. Given that more than half of individuals with SUD relapse within a year of treatment, a nuanced understanding of interoceptive dysfunction within these disorders may facilitate targeted somatic interventions aimed at reducing drug craving, use, and relapse. Substance abuse can have a detrimental effect on the brain's ability to process interoceptive information. It can also affect the reward system and lead to a decrease in sensitivity to natural rewards while increasing sensitivity to drugs. Those who suffer from SUD tend to have an exaggerated perception of heart sensations, but their brain's resources for processing these sensations are reduced. Research studies have found that patients with various SUDs like alcohol, opioid, synthetic cannabinoid, or tobacco addiction, have a poorer performance in the heartbeat tracking task when compared to healthy individuals. It has also been observed that the Heartbeat perception scores of patients are associated with certain SUD-related features such as drinking obsessions, craving sensations, or difficulty in identifying emotions. The anterior part of the insula plays a crucial role in processing interoceptive cues. These cues are

signals from the body that provide conscious access to subjective feelings. In drug users, these cues become strongly associated with the rewards of drugs. Therefore, damage to the insula may reduce the power of these conditioned stimuli to generate cravings. There is potential for new therapies, such as mindfulness, interoceptive training, brain stimulation, or vagal nerve stimulation to target interoception in the treatment of addiction. Studies have shown that these particular interventions can lead to changes in the insular cortex, which is the main center for interoception. Although there is a rising interest in interoception in addiction research, further studies are required to gain a better understanding of the role of interoception in SUD. Additionally, new methods should be developed to investigate how individuals with addiction process and interpret internal bodily sensations.

Keywords : Interoceptive Attention; Substance Use Disorder; Addiction

Count: 182
Abstract ID: 486
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

The impact of parental nicotine abstinence on pain perception in the first generation of male rats.

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Background and Aim : Over the course of recent decades, there has been a significant surge in the prevalence of nicotine use and misuse within the adolescent demographic. The development of neurotransmitter systems can be influenced by prenatal exposure to addictive substances, which can subsequently lead to long-term alterations in pain sensitivity. It is obvious how important it is to research how people perceive pain and any potential underlying causes. The aim of this study was to investigate the effect of nicotine abstinence on the pain behavior of offspring which was assessed by formalin test.

Methods : In this experimental investigation, nicotine was administered to both male and female rats for a duration of 30 days, with a dosage of 1mg/kg given twice daily. This was preceded by a 10-day period of abstaining from nicotine administration, commonly referred to as a wash-out phase. Subsequently, rats, both male and female, were mated, and the resulting progeny were categorized into four distinct groups: control, offspring of mothers exposed to nicotine (MNE), offspring of fathers exposed to nicotine (PNE), and offspring of both mothers and fathers exposed to nicotine (MNE+PNE). Male offspring aged 60 days old were subjected to a formalin test. A diluted solution of formalin (1% in saline) was subcutaneously injected into the dorsal region of the right hind paw as a painful stimulus in this study. The duration of time that the animals devote to licking the injected paw provides the outcome. There are two discernible periods characterized

by increased licking behavior.: an initial phase that spans the initial 5 minutes following formalin injection, and a subsequent phase that occurs between 20 and 30 minutes post-injection.

Results : The formalin test data revealed a significant increase in the number of paw-licking behaviors exhibited by the MNE+PNE group during the acute phase, as compared to the MNE group. During the chronic phase, there was a significant increase in the number of paw?licking behaviors seen in both the PNE group and the MNE+PNE group, as compared to the control group ($P<0.001$). The results of the data analysis indicated that there was no statistically significant difference in the overall duration of paw licking seen in both the acute and chronic stages across the various groups ($p > 0.05$).

Conclusion : Numerous investigations conducted on both human and animal subjects have demonstrated the impact of nicotine on the perception of pain. These studies indicate that the utilization of nicotine by parents who have refrained from its use can influence the way their offspring respond to pain.

Keywords : Nicotine, Addiction, Pain, Male Rats, Offspring, Formalin test

Count: 183
Abstract ID: 383
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Oral

the effectiveness of clay therapy on self-esteem of children with specific learning disorder(dyslexia)

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Background and Aim : A specific learning disorder may cause academic success to be painful for a child and often leads to discouragement, low self-esteem, chronic frustration, and disruption of relationships with peers.

Methods : Current study investigates the effectiveness of clay therapy on self-esteem of children with specific learning disorder(dyslexia). This research is a quasi-experimental study with pre and post- tests and follow-up stages. First 30 children with specific learning disorder were selected from a counseling center located in District 3 of Tehran. They were assigned randomly in to two groups of 15 experimental and control groups. Clay therapy was conducted with the experimental group during 11 sessions (90 min for each session) and the control group did not receive any interventions and waited in the waiting list to receive the same intervention after the end of the experiment. Then Coopersmith Self-esteem Inventory (SEI) were administered at post-test and pretest and follow-up for the two groups. The obtained data were analyzed via repeated measurement and Multivariate analysis of variance (MANCOVA).

Results : The results of analysis of covariance showed that there is a significant increase in self-esteem compared to the control group.

Conclusion : Regarding the findings of present research, it seems that clay therapy can be utilized as an effective and efficient therapeutic intervention to increasing self-esteem($p<0.05$ effect size 0/54) in children with specific learning disorder. Also, it was shown that the effect of this instruction was consistant even after 1/5 months.

Keywords : Self-esteem ,specific learning disorder, clay therapy

Count: 184
Abstract ID: 274
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Oral

Comparison of Psychological Tenacity and Irritability of Blood Groups

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Background and Aim : One of the hereditary characteristics proven in humans is blood groups. Many biological scientists believe that the character, character, behavior, power, efficiency, creativity and mood of each person depends on his blood type. Therefore, the present study was conducted with the aim of comparing psychological tenacity and irritability in blood groups A, B, and O.

Methods : This descriptive research is causal-comparative. The statistical population included all students of Mazandaran University of Science and Technology in 2023. The sampling method was available and the sample size was 60 people (20 people from each blood group A, B and O). Data collection tools included Kubasa Psychological Tenacity Questionnaire and Irritability Questionnaire. To analyze the data, multi-way analysis of variance and Tukey's post hoc test were used.

Results : The findings showed that psychological toughness and its subscales (commitment, control, challenge) do not differ significantly between blood groups A, B and O ($P>0.05$). However, there is a statistically significant difference between excitability and its subscales in the studied blood groups ($P<0.05$).

Conclusion : Researches have shown that in most cases there is a relationship between psychological and personality traits and blood groups.

Keywords : Psychological Tenacity, Irritability, Blood Groups

Count: 185
Abstract ID: 524
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Oral

The use of artificial intelligence in the diagnosis of depression

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Background and Aim : Major depressive disorder (MDD) is a prevalent mental illness that is diagnosed through questionnaire-based approaches; however, these methods may not lead to an accurate diagnosis. In this regard, many studies have focused on using electroencephalogram (EEG) signals and machine learning techniques to diagnose MDD.

Methods : This thesis proposed three frameworks for automatic EEG-based MDD diagnosis. In the first framework, which is based on conventional machine learning methods, different types of EEG-derived features were extracted using statistical, spectral, wavelet, functional connectivity, and nonlinear analysis methods. The second framework is based on Dictionary learning approaches and functional connectivity features. Firstly, a feature space of MDD and healthy control (HC) participants was constructed via functional connectivity features. Next, dictionary learning classification approaches such as Label Consistent K-SVD (LC-KSVD) and Correlation-based Label Consistent K-SVD (CLC-KSVD) methods were utilized to perform the classification task. This third framework is based on the image construction from EEG signals and deep learning techniques. In this framework, two images based on spectral and functional connectivity features were constructed from EEG signals. Afterward, these images were applied to a two-stream convolutional neural network (CNN), and the outputs of them are concatenated. Finally, the concatenating result is applied to a sequential model of long short-term memory (LSTM), fully-connected, and softmax layers to classify each sample into the MDD and HC classes.

Results : In order to validate the proposed approach, a public EEG dataset was used consisting of EEG data acquired from 34 MDD patients and 30 HC subjects. The evaluation of the proposed frameworks is conducted using 10-fold cross-validation, providing the metrics such as accuracy (AC), sensitivity (SE), specificity (SP), F1-score (F1), and false discovery rate (FDR). The average

AC obtained by the first, second and third frameworks was 99.0%, 99.0% and 99.12%, respectively.

Conclusion : These results indicate that the proposed frameworks were able to perform better than previous methods for automatic MDD diagnosis based on EEG signals using artificial intelligence approaches. Also, the obtained results of the three proposed frameworks show their accurate and stable performance in the automatic diagnosis of MDD, which indiciate their high potential for using them as computer-aided diagnosis systems (CAD) for early and accurate MDD diagnosis.

Keywords : Major depressive disorder, Electroencephalogram , Artificial intelligence, Machine Learning, Dictionary learning, Deep Learning

Count: 186
Abstract ID: 492
subject: Neuropsychiatry and Psychology: PTSD
Presentation Type: Poster

The relationship between beliefs about stress and brain wave quantitative patterns with the dimensions of posttraumatic growth in persons with a history of trauma

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Background and Aim : The aim of this study was to investigate the relationship between beliefs about stress and quantitative pattern of brain waves with post-traumatic growth dimensions in people with a history of hospitalization due to Covid-19 disease in hospital.

Methods : For this purpose, 66 people recovered and discharged from Baharloo Hospital in Tehran due to Covid-19 disease, with informed oral and written consent in an accessible way, selected, and after performing the Beliefs About Stress Scale (BASS) and Post Traumatic Growth Inventory (PTGI), all subjects were assessed by quantitative electroencephalogram (QEEG) analysis.

Results : The results of ridge regression and Pearson's Correlation analysis showed that the predictive power of brain waves is higher than the beliefs about stress scale for post-traumatic growth phenomenon and the subscales and total score of stress-related beliefs were compared. They had no predictive power with brain components. In order from high to low considering the positive or negative effect of brain components to predict post-traumatic growth components including asymmetry negatively for new possibilities, asymmetry negatively for relating to others, asymmetry negatively for total growth score, F3 alpha negatively for relating to others, SMR F4 positively for spiritual change, parietal alpha positively for new possibilities, SMR F3 positively for new possibilities. In contrast, the variables of beliefs about stress scale (positive stress-related

beliefs, negative stress-related beliefs, stress-related controllability beliefs) and QEEG patterns did not significantly predict the variables of appreciation of life and personal strength.

Conclusion : Also, subscales and total scores of beliefs about stress were not predictive compared to brain components. Therefore, it can be said that the quantitative pattern of brain waves has the power to predict growth after trauma.

Keywords : stress, COVID-19, posttraumatic growth, trauma

Count: 187
Abstract ID: 141
subject: Neuropsychiatry and Psychology: Functional Neurological Symptom Disorder
Presentation Type: Poster

miRNAs as potential therapeutic method for treating Down syndrome disease

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Background and Aim : -Down syndrome (DS) is the most common aneuploidy, caused by an extra copy of all or part of chromosome 21 (chr21). Differential microRNA (miRNA) expression is involved in many human diseases including DS. . A number of miRNAs are overexpressed in down syndrome, including miR155, miR802, miR 125b2, let7c and miR99a. This overexpression may contribute to the neuropathology, congenital heart defects, leukemia and low rate of solid tumor development observed in patients with DS. MiRNAs located on other chromosomes and with associated target genes on or off chromosome 21 may also be involved in the DS phenotype. Notably, a range of cellular processes, including cell proliferation, apoptosis and tumorigenesis, organogenesis, hematopoiesis and developmental timing, are controlled by miRNAs.

Methods : -They profiled genome-wide miRNA expression in placenta samples from euploid or DS fetuses by using microarray technology and predicted the functions of differentially expressed miRNAs using bioinformatics tools.

Results : -Some of the miRNAs are highly abundant in the nervous system, where they play key roles in developmental neurobiology. Numerous studies have shown a dysregulation of miRNAs in neurological disease . These alterations in miRNAs expression prior to the onset of or during the course of disease pathology raises the possibility that expressing or inhibiting specific miRNAs might ameliorate the disease process and provide an effective therapeutic strategy. For example, Alzheimer's disease (AD) is being tested for potential miRNA-based therapy. It has reported that

a member of the miR-15/107 superfamily, miR-16 can specifically inhibits the expression of AD biomarkers A? and Tau, as well as brain inflammation and oxidative stress.

Conclusion : Growing evidences have shown that miRNAs play a key role in biological function and cell homeostasis. If the miRNAs are dysregulated, they lead to the development of many disease phenotypes. The miRNAs have immense potential in the clinical arena because they can be detected in the blood, serum, tissues, and fine-needle aspirate specimens. , miRNAs are poised to provide diagnostic, prognostic, and therapeutic targets for several diseases. As the field continues to grow, miRNA-based therapeutics may develop a novel class of drugs for different diseases.

Keywords : Down Syndromw(DS),miRNA,Therapeutic Effect

Count: 188
Abstract ID: 628
subject: Neuropsychiatry and Psychology: Functional Neurological Symptom Disorder
Presentation Type: Poster

neurofeedback on learning disorder with attention deficit/hyperactivity disorder

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Background and Aim : : The purpose of this study was the comparison the effectiveness of motor skill training with neurofeedback on LD with attention deficit/hyperactivity disorder (ADHD).

Methods : This study was conducted as a quasi-experimental study without a control group. The statistical population of this research included all students aged 7 to 14 years old with LD along with attention deficit/hyperactivity disorder in Mashhad city who had referred to the counseling and treatment centers of this city and received a diagnosis. In order to select the participants in the research, the Atiyeh Center, which performs neurofeedback work in Mashhad; The reference and research sample, which included 12 children with LD with attention deficit/hyperactivity disorder, were selected as available. In this study, children received 40 neurofeedback sessions three times a week. Children were evaluated and compared with LDES and CAS tests in two stages before and after neurofeedback training. Data were analyzed using the dependent t-test.

Results : The results showed that neurofeedback was not effective on the LD of this group of students ($P>0.05$, (t:1.020) but it was effective on their ADHD ($P<0.05$, (t:4.490)). It has been effective on both their LD and ADHD ($P<0.001$).

Conclusion : The use of as motor skills training for children with LD and ADHD disorders can be effective. Neurofeedback can be effective on ADHD.

Keywords : Neurofeedback, ADHD; Learning Disability; Students.

Count: 189
Abstract ID: 477
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Poster

The ω-3 endocannabinoid docosahexaenoyl ethanolamide reduces seizure susceptibility in mice by activating cannabinoid type 1 receptors

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Background and Aim : Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) are the most recognized omega-3 unsaturated fatty acids showing neuroprotective activity in animal and clinical studies. Docosahexaenoyl ethanolamide (DHEA) and eicosapentaenoyl ethanolamide (EPEA) are non-oxygenated endogenous metabolites of DHA and EPA, which might be in charge of the anti-seizure activity of the parent molecules. We examined the effect of these metabolites on the threshold of clonic seizures induced by pentylenetetrazole (PTZ). DHEA and EPEA possess similar chemical structure to the endogenous cannabinoids. Therefore, involvement of cannabinoid (CB) receptors in the anti-seizure effect of these metabolites was also investigated.

Methods : DHA (300μM), DHEA (100 and 300 μM), EPEA (300 and 1000 μM), AM251 (CB1 receptor antagonist), and AM630 (CB2 receptor antagonist) were administered to mice (n=10 in each group) by intracerebroventricular (i.c.v.) route. Threshold of clonic seizures was determined 10 and/or 15 min thereafter by intravenous infusion of PTZ. The effect of DHA and DHEA on seizure threshold was then determined in mice, which were pretreated with AM251 (5 μg/mouse) and/or AM630 (1, 0.2, 0.02 μg/mouse).

Results : DHA, and DHEA significantly increased seizure threshold, 15 ($p < 0.05$) and 10 min ($p < 0.01$) after administration, respectively. DHEA was more potent than its parent lipid, DHA in decreasing seizure susceptibility. EPEA did not change seizure threshold. AM251 fully prevented the increasing effect of DHA and DHEA on seizure threshold ($p < 0.05$). AM630 did not inhibit the effect of DHA and DHEA on seizure threshold.

Conclusion : This is the first report indicating that DHEA but not EPEA, possesses anti-seizure action via activating CB1 receptors. DHEA is more potent than its parent ω-3 fatty acid DHA in diminishing seizure susceptibility.

Keywords : ω-3 fatty acids; endocannabinoids; ethanolamide derivative; seizure threshold

Count: 190
Abstract ID: 644
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Oral

The role of neurotransmitters in glioblastoma multiforme-associated seizures

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Background and Aim : GBM, or glioblastoma multiforme, is a brain tumor that poses a great threat to both children and adults, being the primary cause of death related to brain tumors. GBM is often associated with epilepsy, which can be debilitating. Seizures and the development of epilepsy are the primary symptoms that have a severe impact on the quality of life for GBM patients.

Methods : It is increasingly apparent that the nervous system plays an essential role in the tumor microenvironment for all cancer types, including GBM. In recent years, there has been a growing understanding of how neurotransmitters control the progression of gliomas.

Results : Evidence suggests that neurotransmitters and neuromodulators found in the tumor microenvironment play crucial roles in the excitability, proliferation, quiescence, and differentiation of neurons, glial cells, and neural stem cells. The involvement of neurotransmitters appears to play a significant role in various stages of GBM. In this review, the focus is on presenting updated knowledge and emerging ideas regarding the interplay between neurotransmitters and neuromodulators, such as glutamate, GABA, norepinephrine, dopamine, serotonin, adenosine, and their relationship with GBM and the seizures induced by this condition.

Conclusion : The review aims to explore the current understanding and provide new insights into the complex interactions between these neurotransmitters and neuromodulators in the context of GBM-related seizures.

Keywords : glioblastoma multiforme epilepsy neurotransmitters

Count: 191
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subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Poster

The modulatory effect of exercise on the Orexin and BDNF cross-talking in epileptic rats

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Background and Aim : Epilepsy as a neurological ailment has been characterized by recurrent seizures associated with cognitive, mental, and social issues. Exercise has been well known as a non-pharmacological or complementary remedy to reduce the effective dose and side effects of pharmacological therapies. Orexin signaling pathway and brain-derived neurotrophic factor (BDNF) have an essential role in the pathogenesis of epilepsy. In this study, we investigated the effect of exercise on the modulation of the orexin-A (OXA) and BDNF signaling pathways in epileptic rats.

Methods : Male Wistar rats were divided into five groups: Normal saline (NS), seizure, physical activity (PA), PA+PTZ (Simultaneously physical activity and pentylenetetrazol (PTZ) injection), and PA-PTZ (first physical activity for four weeks, then Simultaneously physical activity and PTZ injection). Assessment of seizure behaviors was done 30 min after any PTZ (35 mg/kg) injection in the seizure, PA+PTZ, and PA-PTZ groups. Seizure behavior score (SBS) was monitored in seizure, PA+PTZ, and PA-PTZ from the moment of seizure induction to 45 min later. The expression of the OXA and BDNF in the CA1 and CA3 regions of the hippocampus and cortex was assayed by immunohistochemistry staining. The correlations were taken between the OXA and BDNF in CA1, CA3, and cortex in different groups.

Results : SBC was reduced in the epileptic rats that had exercised. Seizure and Physical activity increased the OXA expression in the CA1, CA3, and cortex of the seizure and PA groups, respectively. The OXA expression decreased in the CA1 and CA3 of the PA+PTZ and PA-PTZ

and cortex of PA+PTZ compared to the seizure group. OXA was up-expressed in the PA-PTZ group compared to the PA+PTZ group. Seizure decreased the BDNF expression in the seizure group compared to the NS group. Physical activity elevated the BDNF expression in the CA1, CA3, and cortex of the PA group. OXA was up-expressed in the cortex of the PA+PTZ and the CA1, CA3, and cortex of PA-PTZ. OXA expression increased in the CA1 and CA3 of the PA-PTZ compared to the PA+PTZ. There was a significant correlation between the OXA and BDNF expression in the CA1, CA3, and cortex of the NS and seizure groups, as well as in the CA1 and cortex of the PA group.

Conclusion : Our results declared that physical activity had an amelioration effect on the seizure severity. Our finding suggested that the effect of physical activity on seizure might not rise from the interaction of the OXA and BDNF expression in epileptic rats.

Keywords : Epilepsy, seizure, exercise, orexin, BDNF

Count: 192
Abstract ID: 72
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Poster

5-HT3 receptor mediates the effects of Minocycline on pentylenetetrazole-induced clonic seizure in mice

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Background and Aim : Minocycline, widely used as an antibiotic, has recently been found to have an anti-inflammatory, neuroprotective and anticonvulsant effects. This study was aimed to investigate the anticonvulsant effect of acute administration of minocycline on pentylenetetrazole (PTZ)-induced seizures considering the possible involvement of 5-HT3 receptor in this effect.

Methods : For this purpose, seizures were induced by intravenous PTZ infusion. All drugs were administrated by intraperitoneal (i.p.) route before PTZ injection. Also, 1-(m-chlorophenyl)-biguanide (mCPBG, a 5-HT3 receptor agonist) and Tropisetron (a 5-HT3 receptor antagonist) were used 45 minutes before minocycline treatment.

Results : Our results demonstrate that acute minocycline treatment (80 and 120 mg/kg) increased the seizure threshold. In addition, the 5-HT3 antagonist, tropisetron, at doses that had no effect on seizure threshold, augmented the anticonvulsant effect of minocycline (40 mg/kg), while mCPBG (0.2 mg/ kg) blunted the anticonvulsant effect of minocycline (80 mg/ kg).

Conclusion : In conclusion, our findings revealed that the anticonvulsant effect of minocycline is mediated, at least in part, by inhibition of 5-HT3 receptor.

Keywords : Minocycline, 5-HT3 receptor; Seizure Threshold, Pentylenetetrazole, Mice

Count: 193
Abstract ID: 585
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Channels, Receptors, Transporters,
Presentation Type: Oral

Cannabinoid receptors and the proconvulsant effect of toxoplasmosis in mice

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Background and Aim : Toxoplasmosis is an infectious disease caused by the intracellular parasite Toxoplasma gondii that harms the brain and increases the risk of epilepsy acquisition. It is well known that cannabinoid (CB) signaling is activated following brain insults and protects the neurons from excitotoxicity and inflammation. We examined the role of CB neurotransmission in the proconvulsant effect of Toxoplasmosis in mice.

Methods : Toxoplasmosis was established in mice by intraperitoneal injection of T. gondii cysts. The mice with acute and/or chronic Toxoplasma infection were pretreated (through intracerebroventricular injection) with CB1 and CB2 receptor agonists (ACEA and HU308) and antagonists (AM251 and AM630), as well as JZL184 (the irreversible inhibitor of mono acyl glycerol lipase, enzyme degrading the endogenous cannabinoid 2-Acyl glycerol). The seizure threshold was then measured by tail vein infusion of pentylenetetrazole.

Results : In healthy uninfected mice JZL184, ACEA, and AM630 increased the seizure threshold in a dose-dependent manner, whereas AM251 and HU308 showed dose-dependent proconvulsant effect. Mice with acute and/or chronic infection had a substantial lower seizure threshold than the uninfected mice. JZL 184, ACEA and AM630 inhibited proconvulsant effect of Toxoplasmosis, while AM251 and HU308 intensified proconvulsant effect of Toxoplasmosis.

Conclusion : CB receptors play a role in proconvulsant effect of Toxoplasmosis in mice.

Keywords : Endocannabinoids, Seizure threshold, Toxoplasma gondii

Count: 194
Abstract ID: 435
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Oral

Olfactory bulb as a suitable target for anticonvulsant effects of both low- and high- frequency stimulation

Submission Author: Parisa Zarei

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Background and Aim : : Deep brain stimulation (DBS) is an alternative treatment for drug-resistive temporal lobe epilepsies. Although high-frequency DBS got FDA approved for the treatment of epilepsy, however, the DBS target and the parameters of DBS for exerting the best therapeutic effect have remained poorly understood. In the present study, we investigated the anticonvulsant effects of low- and high-frequency stimulation (LFS and HFS) of olfactory bulb on kindled seizures.
Methods : Rats underwent a kindling procedure using semi-rapid (6 stimulations per day) electrical stimulation of the hippocampal CA1 region. Full kindled animals received either LFS (1 Hz) or HFS (130 Hz) at 5 min, 6 h, 24 h, and 30 h after the last kindling stimulation. Then, a kindling stimulation was applied and the seizure behavior and afterdischarges were evaluated. In addition, the excitatory and inhibitory postsynaptic currents (EPSC and IPSC) were recorded in the pyramidal neurons of the hippocampal CA1 region by whole cell patch clamp technique.
Results : Overall, applying DBS in the OB at both low-and high- frequencies alleviated the seizure severity in the hippocampal-kindled rats. Furthermore, applying both LFS and HFS to the olfactory bulb of full-kindled animals led to a decrease in the amplitude, area, and rise slope of EPSCs and an increase in the amplitude, area, and rise slope of IPSCs. Interestingly, the excitation-to-inhibition ratio decreased following both LFS and HFS applications in kindled animals.
Conclusion : The olfactory bulb is a potential DBS target for the treatment of epilepsy. In addition, applying DBS at both low- and high-frequencies exerts similar anticonvulsant effects showing that LFS may also be as effective as HFS in epilepsy treatment.
Keywords : Epilepsy; Deep brain stimulation; Olfactory bulb; Hippocampus; Seizure

Count: 195
Abstract ID: 379
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Oral

Stimulation of principal pathways of hippocampal formation with different frequencies and evaluation of its effect on spatial memory consolidation in male rats

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Background and Aim : Memory formation requires functional and structural changes of cerebral neurons at the point of connection to each other, synapses. A new task is committed to long-term memory when it goes through the process of memory consolidation. It is known that after acquiring a new task, theta waves are formed in the temporal lobe when a person is resting or sleeping, and it is believed that the occurrence of these waves consolidates memory. Also, studies have shown that in the molecular layer of the hippocampus, in dendrite zone, sharp waves known as high-frequency ripples are created, and their appearance is related to synaptic plasticity and memory consolidation. Many studies have investigated the effect of high and low frequency stimulation on memory, and contradictory results have been obtained. The hippocampus is a three-synaptic structure. The perforant nerve pathway from the entorhinal cortex to the dentate gyrus (first synapse), the mossy axons from the dentate gyrus to CA3 (the second synapse) and the lateral Schaffer pathway from CA3 to CA1 (the third pathway) make this structure. Stimulation of these neural pathways is of interest to researchers to investigate to boost or erase specific memories, and many studies have been conducted in this regard. But, to our knowledge, there is no study examining the effect of electrical stimulation of the main hippocampal nerve pathways on memory consolidation in conscious animals with high or low frequency and comparing these two set of paradigms with each other.

Methods : In this study, two hours after learning, the effect of the perforant and lateral Schaffer paths stimulation with high frequency (200 Hz) or low frequency (4 Hz) on the spatial memory formation were investigated. Using stereotaxic surgery, stimulating electrodes were implanted in the perforant or lateral Schaffer path and recording electrodes in placed in the dentate gyrus or CA1 in male Wistar rats. Then, after confirming the electrophysiological recording, they were

fixed to the skull with dental cement. After recovery, spatial learning was induced using the Morris water maze over three consecutive days. Electrical stimulation was performed two hours after each learning session (i.e. post-learning treatment) and spatial memory was examined on the fourth day.

Results : The results showed that the stimulation of the perforant or lateral Schaffer pathways with high frequency strengthened of the synaptic responses in the dentate gyrus or CA1, respectively. Stimulation of the perforant pathway enhanced learning and spatial memory, but stimulation of the lateral Schaffer pathway had no effect. Low-frequency stimulation did not change the synaptic responses in the dentate gyrus or CA1, while it declined spatial memory both sets.

Conclusion : These findings show that only high-frequency stimulation applied to the perforant pathway improves memory, and low-frequency stimulation to both pathways disturbed spatial memory. Also, the memory change was not in the same direction with the postsynaptic plasticity in both areas. Thus, synaptic strengthening or weakening in glutamatergic pathways does not necessarily mean memory improvement or impairment, respectively.

Keywords : memory; spatial memory; synaptic plasticity; hippocampus; dentate gyrus

Count: 196
Abstract ID: 85
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

Comparison among therapeutic effects of escitalopram, crocin and co-administration of them on long-term potentiation of hippocampal CA1 area in rats with depression

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Background and Aim : Depression impairs brain functions such as memory. In addition, escitalopram as chemical medication and crocin as an effective substance of saffron leads to improvement of learning and memory. This study investigated the therapeutic effects of co-administration of escitalopram and crocin on long-term potentiation (LTP) of hippocampal CA1 area (as cellular mechanism of memory) in rats with chronic stress-induced depression.

Methods : In this study, 56 male rats were randomly divided into seven groups: control, sham, depression, depression-recovery, depression-escitalopram, depression-crocin and depression-escitalopram-crocin. To induce depression, the rats received restraint stress for 6 h daily during 14 days. Then, the subjects with depression received intraperitoneal injections of optimum dose of escitalopram oxalate (20 mg/kg) and crocin (30 mg/kg) for 14 consecutive days. Slope and amplitude of field excitatory postsynaptic potential (fEPSP) were recorded from the hippocampal CA1 before and after LTP induction.

Results : The slope and amplitude of fEPSP after LTP induction significantly decreased only in depression group. Both slope and amplitude of fEPSP increased by escitalopram alone, escitalopram-crocin and particularly crocin alone in subjects with depression.

Conclusion : Depression had a detrimental effect on long-term plasticity of CA1 area, while recovery period did not improve them. Crocin alone and escitalopram-crocin respectively acted better than escitalopram alone on improvement of plasticity in subjects with depression. It seems that crocin partially acted better than Escitalopram on improvement of plasticity and/or memory in hippocampal CA1 area in depression condition.

Keywords : Depression, Stress, Memory, Long-term potentiation, Crocin, Escitalopram.

Count: 197
Abstract ID: 220
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Oral

Role of M1 microglia on contralateral hippocampal long-term potentiation changes following unilateral intracerebral hemorrhage

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Background and Aim : Stroke is one of the important causes of death or permanent disability. Studies show that two-thirds of affected people show different degrees of cognitive disorders, one of the most important cognitive disorders is memory disorder. Clinical studies show inflammation followed by contralateral hippocampal atrophy in patients with unilateral hippocampal damage. The formation and consolidation of memory is accompanied by synaptic and molecular changes in neurons, which are recorded by certain patterns after electrical stimulation, which is called long term potential (LTP). Despite many researches, LTP and the degree of inflammation in the contralateral hippocampus after unilateral hippocampal damage are still unclear, for this reason, in this study, we investigated these parameters.

Methods : In this study, 48 male Wistar rats were used and randomly divided into 6 groups. After the induction of ICH, in order to reduce the role of M1 microglia, minocycline was given orally to rats for 7 days and 14 days. At the end, to investigated the activity of neurons in the contralateral hippocampus, LTP was recorded and the volume of the hippocampus and the number of neurons were measured by histological studies. The amount of NF-kB cells as a marker of inflammation was measured by immunohistochemical test.

Results : Contralateral hippocampal changes in excitatory potential amplitude and slope significantly increased in both ICH-7 and ICH-14 groups compared with shams groups, on the other hand, there was no significant difference in these parameters between the sham groups and the groups that received minocycline. The cell count in the contralateral hippocampus was higher in the ICH groups than in the sham groups and minocycline groups. However, hippocampus volume did not change significantly between groups. The immunohistochemical results showed that the NF-κB positive cell count was noticeably higher in contralateral hippocampus of the ICH groups than in the sham groups, but administration of minocycline has significantly reduced this rate compared to the ICH groups.

Conclusion : unilateral hippocampal damage increases inflammation in the contralateral hippocampus, and then, to compensate for the damage, the amount of LTP increases. Administering minocycline could prevent damage to the hippocampus on the opposite side.

Keywords : Long-term potentiation, Hippocampus, Microglia, Stroke

Count: 198
Abstract ID: 337
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

Fixed rabies virus alters synaptic function

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Background and Aim : The rabies virus (RABV) is a neurotropic virus that spreads trans-synaptically between neurons. Minor histological changes in the infected brain suggests a neuronal dysfunction, but limited data exist pertaining to RABV influence on neuronal/synaptic function. We examined the effect of challenge rabies virus-11 (CVS-11) on the hippocampal synaptic function.

Methods : Two µl of 105 LD50 CVS-11 was bilaterally microinjected into the dorsal hippocampus. Field potentials were evoked in dentate gyrus (DG) to determine basic synaptic activity, short and long-term synaptic plasticity on 2, 24, 72, 96 and 120 h post-infection. Histological examination and determination of pro- and anti- inflammatory cytokines, IL-1β, TNF-α and IL-10, were also performed.

Results : Basic synaptic activity was declined after 72 h post-infection and reached less than 50 % of base line at 120 h. No significant changes were observed for short synaptic plasticity except when the inter-stimulus interval was 25 ms. CVS-11 infected rats showed enhanced long-term potentiation (LTP) of the population spike (PS) at 2 h post-infection, but the PS amplitudes were decreased at 24 h and continued to reach below 50% of baseline on 96 and 120 h post-infection. Noticeable neurodegeneration was found after 72 h post-infection. Pro- and anti-inflammatory cytokines were prominently elevated at all time points.

Conclusion : In conclusion, fixed RABV highly facilitated evoked synaptic activity at the early phase but suppresses basal and evoked synaptic activity at the late stages. These findings may explain the hyper-excitability of neural circuit underlying rabies associated behaviours including hydrophobia following frequent exposures to the stimulus.

Keywords : rabies virus; synapse; brain; cytokines

Count: 199
Abstract ID: 399
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Gliology (Gliotransmission, Gliogenesis, Neuro-glia Cross Talk)
Presentation Type: Poster

Effects of chronic uncontrolled hyperglycemia on neuroglial population of CA3 region of hippocampus: A study by TEM

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Background and Aim : Altered function of astrocytes has been noticed in diabetes mellitus type 1. Aims: This study was carried out to determine the effects of chronic uncontrolled hyperglycemia on neuroglial elements of the CA3 region of hippocampus.

Methods : Diabetes was induced in adult male wistar rats by application of streptozotocin (60mg/kg). After 8 weeks, the hippocampi were removed and the number of astrocytes and degenerated neurons in CA3 were studied using transmission electron microscopy.

Results : The astrocytes exhibited structural changes, including reduced electron density of the nucleus, electro-lucent heterochromatin, and vacuolated cytoplasm. The mean number of astrocytes in the CA3 region of diabetic group (7±2) showed a significant increase compared to the control group ($P<0.05$). The number of degenerated neurons in the diabetic animals showed significant level of difference in comparison with control ($p<0.05$).

Conclusion : Our data revealed that chronic diabetes mellitus type 1is associated with increase in the mean number of astrocytes and ultrastructural astrocyte changes in the CA3 region of hippocampus.

Keywords : Hippocampus, hyperglycemia, neuroglial, TEM.

Count: 200
Abstract ID: 633
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Investigating the Effects of Foot Electrical Stimulation at an Intensity of 0.1 mA on inhibiting pentylenetetrazol-induced kindling in rats

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Background and Aim : Previous research revealed the potential anticonvulsant effects of electrical stimulation. The present study aimed to examine the effects of foot electrical stimulation in male rats on inhibiting the development of chemical kindling induced by pentylenetetrazol (PTZ). Thus, the foot electrical stimulation was performed using a frequency of 3 Hz and an intensity of 0.1 mA on epilepsy in rats that have recently been kindled with pentylenetetrazol.

Methods : The standard PTZ kindling model was induced by injecting PTZ (37.5 mg/kg) a total of 13 times at 48-hour intervals. To evaluate convulsive behaviors in the animals, their behavior was recorded for to 20 minutes following drug injection. Male Wistar rats were divided into two groups: a control group and a group that received 20 minutes of electrical stimulation. The stimulation parameters included an intensity of 0.1 mA and a frequency of 3 Hz. The stimulation was given after the rats reached stage five seizure

Results : The results demonstrated that foot electrical stimulation with an intensity of 0.1 mA and a frequency of 3 Hz has an excitatory effect on the stage 5 latency($P<0.05$), and reduces the time required to animal reach the 5th stage of seizure. Furthermore, there was no significant effects on the other seizure parameters such as seizure stage, stage 2 latency and stage 5 duration.

Conclusion : In conclusion, we found that foot electrical stimulation at an intensity of 0.1 with a frequency of 3 Hz had a stimulating effect on the seizure's parameters.

Keywords : Epilepsy, Foot Electrical Stimulation, PTZ

Count: 201
Abstract ID: 468
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Comparing the Synaptic Potentiation in Schaffer Collateral-CA1 Synapses in Dorsal and Intermediate Regions of the Hippocampus in Normal and Kindled Rats

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Background and Aim : There is growing evidence that the hippocampus comprises diverse neural circuits that exhibit longitudinal variation in their properties, however, the intermediate region of the hippocampus has received comparatively little attention. Therefore, this study was designed to compared short- and long-term synaptic plasticity between the dorsal and intermediate regions of the hippocampus in normal and PTZ-kindled rats.

Methods : Short-term plasticity was assessed by measuring the ratio of field excitatory postsynaptic potentials' (fEPSPs) slope in response to paired-pulse stimulation at three different inter-pulse intervals (20, 80, and 160 ms), while long-term plasticity was assessed using primed burst stimulation (PBS).

Results : The results showed that the basal synaptic strength differed between the dorsal and intermediate regions of the hippocampus in both control and kindled rats. In the control group, paired-pulse stimulation of Schaffer collaterals resulted in a significantly lower fEPSP slope in the intermediate part of the hippocampus compared to the dorsal region. Additionally, the magnitude

of long-term potentiation (LTP) was significantly lower in the intermediate part of the hippocampus compared to the dorsal region. In PTZ-kindled rats, both short-term facilitation and long-term potentiation were impaired in both regions of the hippocampus.

Conclusion : Interestingly, there was no significant difference in synaptic plasticity between the dorsal and intermediate regions in PTZ-kindled rats, despite impairments in both regions. This suggests that seizures eliminate the regional difference between the dorsal and intermediate parts of the hippocampus, resulting in similar electrophysiological activity in both regions in kindled animals. Future studies should consider this when investigating the responses of the dorsal and intermediate regions of the hippocampus following PTZ kindling.

Keywords : Short-term synaptic plasticity; Long-term synaptic plasticity; Field potentials; Seizure; PTZ kindling; Hippocampus

Count: 202
Abstract ID: 462
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

The role of Cuproptosis, a new programmed cell death, in Temporal lobe epilepsy

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Background and Aim : Temporal lobe epilepsy (TLE) is a neurological disease, characterized by seizure occurrence, neuronal loss, gliosis, and sprouting mossy fibers in the hippocampus. TLE affects up to 1% of adults. Recently, a type of programmed cell death, cuproptosis, has been discovered. Evidence has been gathered to suggest that trace amounts of copper induce neurotoxicity.

Methods : -Neurohistochemical studies revealed that low concentration of copper further stimulated the amyloid precursor protein (APP) upregulation, activate inflammatory pathway and exacerbate neurotoxicity and contributed to amyloid beta-peptide (Abeta) deposition in the brain of mice. Copper also increases the protein expression level of tumor necrosis factor-alpha (TNF-alpha). Numerous studies have confirmed that copper significantly increases cerebral inflammatory factors, including nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB) p65, TNF-α and interleukin 6 (IL-6), and inflammation has also been reported to increase copper levels in tissues .On the other hand immune cell infiltration contribute to the pathogenesis and progress of epilepsy. The identification of genes related to the cuproptosis pathway can provide clues to investigate TLE caused by copper toxicity-related cell death.

Results : It is hypothesized that cuproptosis is involved in the mechanism of hippocampal neuronal death in TLE. The Sample dataset revealed four expressed cuproptosis-dependent genes (DECRGs; LIPT1, GLS, PDHA1, and CDKN2A) while the E-MTAB-3123 dataset displayed seven DECRGs (LIPT1, DLD, FDX1, GLS, PDHB, PDHA1, and DLAT). Remarkably, only LIPT1 was uniformly upregulated in both datasets. Research have confirmed that genes such as DECRGs and LIPT1 are related to cuproptosis. DECRGs are implicated in the cell respiration and various immune cell infiltrations, especially macrophages and T cells, in the TLE hippocampus.

Furthermore, LIPT1 appear as potential targets of neuronal cuproptosis for controlling TLE's seizures and progression. -

Conclusion : Investigating the genes involved in cuproptosis and its relationship with TLE can be a new and useful approach. In this abstract, we intend to draw the attention of researchers to this new field. Drugs that can block the genetic and biochemical pathways of cuproptosis are good candidates for the treatment of TLE.

Keywords : Cuproptosis; Temporal lobe epilepsy; Cerebral inflammatory factors; Copper

Count: 203
Abstract ID: 602
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Is optogenetics a new treatment for epilepsy?

Submission Author: Elaheh Hassannezhaddaneshmand

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Epilepsy, a neurological disorder characterized by repetitive seizures. These seizures result from temporary disruptions in the brain's electrical activity, causing sudden changes in behavior. Optogenetics is a powerful and rapidly expanding technique that utilizes genetically encoded light-sensitive proteins, including opsins, to modulate neuronal activity, intracellular signaling pathways, or gene expression with high specificity concerning space, direction, time, and cell type. Optogenetics is a versatile tool that has significantly advanced various neuroscience fields such as controlling nervous system disorders like epilepsy. Optogenetics involves different types of light-sensitive proteins, including non-selective cation channels that allow the passage of Na, K, H, and Ca ion along their concentration gradients, depolarizing the cell. Another type of light-sensitive protein is chloride pumps that actively pump chloride ions into the cell, increasing the intracellular chloride concentration, hyperpolarizing the intracellular space, and lowering the probability of action potential generation. Outward proton pumps are the third type of light-sensitive protein that inhibits neuronal activity by actively pumping protons out of the cell, decreasing their concentration within the cell, hyperpolarizing (and alkalizing) the cell, and decreasing the likelihood of action potential generation. G-protein coupled receptor opsins offer methods for manipulating neural activity via intracellular signaling cascades. The family of G-protein coupled receptor opsins are referred to as OptoXRs, which includes opto-α1-AR (triggering an α-adrenergic receptor-like response through activation of the Gq protein) and opto-β2-AR (triggering a β-adrenergic receptor-like response through activation of the Gs protein). Chloride channel opsins allow for the passive flow of chloride ions across the membrane, typically hyperpolarizing the cell, decreasing membrane resistance, and decreasing the likelihood of action potential generation. In contrast, using ChR2 to activate PV cells near the seizure focus resulted in seizure cessation in one study. Another study showed that activating GABA INs (GABA inhibitory neurotransmitter) in the subiculum delayed generalized seizures after TLE, which contradicts the previous findings. Optogenetics can also reduce and stop seizures in epilepsy by using inhibitory methods. Scientists use inhibitory luminopsins to achieve cell type-specific inhibition, like conventional opsins without the need for external hardware or chronic implants to deliver light. Scientists found that through the expression of iLMO2 (a kind of luminopsin) in different limbic structures of mice, it can suppress focal epileptiform secretions caused by bicuculline injection in the hippocampus of unconscious mice, as well as four different nodes in the brain, including the

dentate gyrus (DG) and the nucleus accumbent. The anterior thalamus (ANT) has an additive effect in suppressing pentylenetetrazol (PTZ)-induced behavioral seizures compared to inhibition of single nodes, which indicates the use and need of optogenetic tools capable of multifocal, scalable, and specific cell type control of neural activity. Optogenetics is an expanding field that allows researchers to manipulate neurons with unparalleled precision and specificity, making it an invaluable tool for answering a wide range of experimental questions. The ongoing development and sharing of novel methods, including those for selective opsin expression, ensure the continued growth and usefulness of optogenetics in epilepsy research.

Keywords : neurodegenerative disease, epilepsy, optogenetic, light-sensitive protein

Count: 204
Abstract ID: 309
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Improving effect of mild foot electrical stimulation on pentylenetetrazole-induced impairment of learning and memory

Submission Author: Monira Abasi Moghadam

Monira Abasi Moghadam[1], Arefe ghasemi dehno[2]

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Background and Aim : Epilepsy is a common neurological disorder that affects learning and memory. Recently it has been shown that mild foot electrical stimulation (MFES) can increase learning and memory in normal rats. Pentylenetetrazole (PTZ) kindling is a model of human epilepsy. As with human epilepsy, PTZ kindling impairs learning and memory in rats. The purpose of this study was to investigate the effect MFES on kindling-induced learning and memory deficits in rats. Forty-nine male Wistar rats weighting 200 to 250 g were divided into the following seven groups: PTZ only, phenytoin only, MFES only, PTZ plus phenytoin, PTZ plus MFES, phenytoin plus MFES, and saline (control), with the treatments administered for 26 days. Forty-eight hours after the last injection, the animals performed the Morris water maze (MWM) task, and spatial learning and memory were measured. The results indicated that although chronic administration of phenytoin inhibited the development of PTZ kindling, it did not exert a protective effect against kindling-induced spatial learning and memory impairment in rats. On the other hand, pretreatment of PTZ-kindled animals with MFES significantly improved spatial working and reference memory. The results point to potential novel beneficial effects of MFES on learning and memory impairment induced by PTZ kindling in rats.

Methods : Forty-nine male Wistar rats weighting 200 to 250 g were divided into the following seven groups: PTZ only, phenytoin only, MFES only, PTZ plus phenytoin, PTZ plus MFES, phenytoin plus MFES, and saline (control), with the treatments administered for 26 days. Forty-eight hours after the last injection, the animals performed the Morris water maze (MWM) task, and spatial learning and memory were measured.

Results : The results of the two-way ANOVA of average learning curves in the control, PTZ, and MFES groups following 4 days of training in the MWM showed a significant difference between

groups ($F(3, 60) = 24.57$, $p < 0.0001$; two-way ANOVA). The post hoc analysis using Tukey's test showed that phenytoin did not have a significant effect on learning acquisition in the MWM test. However, PTZ significantly decreased learning ability, and MFES significantly increased learning ability in the test as compared

Conclusion : The results of the present study showed that MFES increased spatial learning and prevented learning deficits in PTZ-kindled rats. These findings indicate that MFES may be an effective neuroprotective agent for the treatment of kindling-related cognitive impairment.

Keywords : Foot electrical stimulation; Kindling; Morris water maze; Pentylenetetrazole; Spatial learning.

Count: 205
Abstract ID: 310
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Mild foot electrical stimulation is comparable with phenytoin in inhibiting pentylenetetrazol-induced kindling in rats

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Arefeh Ghasemidehno[1], monira abasi Moghadam[2]

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Background and Aim : Increasing evidence demonstrates that electric stimulation has anticonvulsant effects. The present study was undertaken to investigate the effects of mild foot electrical stimulation (MFES) on the development of pentylenetetrazol (PTZ) kindling and compare its effectiveness with the more commonly used treatment, phenytoin. Kindling was induced in rats by repeated injections (every 24 h) of PTZ (37.5 mg/kg). The rats were subjected to either MFES (0.2 mA in intensity for a 160 ms duration with a 160 ms interval for 20 min) or phenytoin (30 mg/kg) before PTZ injections. Following this treatment, rats received MFES every other day for 10 days or 26 days after establishment of PTZ kindling. The data showed that MFES significantly inhibited development of chemical kindling induced by PTZ in rats ($p = 0.001$, as compared to PTZ-treated animals). This inhibitory effect is comparable with the effect of 30 mg/kg doses of phenytoin ($P = 0.99$, as compared to phenytoin group). However, 10 days or 26 days durations of MFES had no effect on established kindled seizures ($P = 0.58$ as compared to PTZ-treated animals). Our data demonstrate that although MFES significantly inhibited the development of chemical kindling, this experimental paradigm had no effect on established kindled seizures.

Methods : Sixty male Wistar rats weighing 200–250 g each were divided into seven treatment groups. Group 1 (n = 12) received PTZ (37.5 mg/kg, ip injection every second day). In this group 60 min before PTZ injection, each rat was placed in the grid box without electrical stimulation for 20 min. Group 2 (n = 12) received MFES during the kindling process (60 min before PTZ injections). Group 3 (n = 12) received phenytoin during the kindling process (30 min before PTZ injections). Group 4 (n = 6) received MFES for 10 days after they reached to the stage five seizure. Group 5 (n = 6) received electric stimulation for 26 days after they reached to the stage five seizure. Group 6 (n = 6) received foot electrical stimulation and group 7 (n = 6) received 30 mg/kg

phenytoin every other day. The rats were housed in environmentally controlled conditions (12 h light–dark cycles, 7:00–19:00 light and 19:00–7:00 dark, temperature 22 ± 2 °C) at the Arak University of Medical Sciences animal facility. Food and water were supplied ad libitum. All procedures were carried out in accordance with EU Directive 2010/63/EU and the University Ethics Committee standards (Arak Uni- versity of Medical Sciences Research Ethics Committee, ethical approval # 94-132).

Results : However, 10 days or 26 days durations of MFES had no effect on established kindled seizures (P = 0.58 as compared to PTZ-treated animals). Our data demonstrate that although MFES significantly inhibited the development of chemical kindling, this experimental paradigm had no effect on established kindled seizures

Conclusion : In conclusion, our results showed that although MFES can suppress the development of PTZ kindling in rats, it had no efect on established kindled seizures

Keywords : Electrical stimulation; Epilepsy; Kindling; Pentylenetetrazol; Phenytoin

Count: 206
Abstract ID: 164
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Evaluation isoform 165 of recombinant human Vascular Endothelial Growth Factor-A (rhVEGF-A-165) effect on maximal electroshock-induced seizures in mice

Submission Author: Reza Zaredar

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Background and Aim : Epilepsy is a brain disease and one of the common annoying neurological diseases. The administration of recombinant proteins has had a preventive effect on animal models of epilepsy. Seizures lead to oxidative stress, blood-brain barrier disorder and increased nitric oxide in the brain of patients with epilepsy. Recombinant human vascular endothelial growth factor type A (rhVEGF-A) has ameliorating effects on neurogenesis, neural functions, and glial cell growth. Here, the effect of VEGF administration on seizures, changes in inflammatory factors and gene expression in mice after maximal electroshock (MES) was investigated.

Methods : Mouse received rhVEGF-A 165 (50, 100 and 150 micrograms/kg body weight) intraperitoneally for 4 days before applying maximal electroshock. Nitric oxide concentration, total antioxidant capacity, and miRNA expression level (5p-142) as well as BBB disruption were measured after treating mice with rh VEGF and MES administration. Also, the contribution of endogenous opioid systems and brain nitric oxide levels were determined after dermal administration with L-NAME and Naltrexone.

Results : Applying maximal electroshock increased nitric oxide production, BBB permeability, decreased total antioxidant capacity, and changed miRNA (5p-142) levels in the brain of rats, and the intraperitoneal administration of rhVEGF-A 165 (100 ?g/kg) for 4 days compared to two Another dose before applying MES caused a significant decrease in these factors.

Conclusion : Applying MES increased NO production, BBB permeability, decreased total antioxidant capacity, and changed miRNA (5p-142) levels in the brain of rats, and the intraperitoneal administration of rhVEGF-A-165(100 µg/kg) for 4 days compared to two Another dose before applying MES caused a significant decrease in these factors.

Keywords : miRNA, VEGF, brain permeability, Oxidative stress, convulsions

Count: 207
Abstract ID: 229
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Angiotensin converting enzyme inhibitor captopril attenuates brain oxidative stress in a mouse model of seizures induced by pentylenetetrazole

Submission Author: MARIYA DAVOUDINEZHAD

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Background and Aim : Epilepsy and seizures are reported to be accompanied with oxidative stress and neuronal damage in the brain. The central nervous system(CNS) is influenced by the renin-angiotensin system (RAS). RAS is reported to have a role in the CNS disorders and their complications. We conducted this study to investigate the protective effects of angiotensin converting enzyme (ACE) inhibitor captopril on brain oxidative stress in a mouse model of seizures induced by pentylenetetrazole(PTZ).

Methods : The groups were including (1) Control in which saline was injected instead of captopril and PTZ; (2) PTZ group in which saline was injected instead of captopril and PTZ(100 mg/kg, i.p.) was injected to induce seizure; and (3-5) PTZ+ Captopril groups in which three doses including 10, 50, and 100 mg/kg of captopril was daily injected during 3 days and then it was injected 30 minutes before PTZ injection in the 4th day. Latency times to the onset of minimal clonic seizures (MCS) and generalized tonic-clonic seizures (GTCS) were documented. The levels of malondialdehyde (MDA) and total thiol, along with the activity of superoxide dismutase (SOD) and catalase (CAT), were quantified in both the hippocampus and cortex.

Results : All doses of captopril delayed the onset of MCS and GTCS. Higher concentrations of MDA and lower thiols and SOD and CAT were seen in the brain tissues of PTZ group than the Control group. Captopril at the highest dose(100 mg/kg) attenuated MDA concentration in the

brain tissue in comparison to the PTZ group. Both 50 and 100 mg/kg of captopril improved total thiol content and the activities of SOD and CAT in the brain tissues.

Conclusion : The results indicated that PTZ induced seizures was accompanied with oxidative stress in the brain. It was also shown that angiotensin converting enzyme inhibitor captopril, attenuated seizures associated oxidative stress in the brain tissues.

Keywords : Captopril, Pentylenetetrazole, Seizures, Mice, Oxidative Stress

Count: 208
Abstract ID: 307
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Alleviating neuroinflammation and oxidative stress in rat model of epilepsy

Submission Author: Maryam Rahimi Tesiye

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Background and Aim : Oxidative stress, which is an imbalance between the production and elimination of reactive oxygen species, is one of the most well-known factors that induce epileptic seizures. Oxidative stress, which in turn is associated with neuroinflammation, is involved in the pathogenesis of epilepsy in several ways. Therefore, the use of anti-inflammatory drugs can have modulating effects on epileptic seizures. The aim of this study is to investigate the effects of fenoprofen on seizure behaviors in the rat model of epilepsy, with a focus on the Nrf2/Ho-1 signaling pathway.
Methods : Male Wistar rats were divided into five groups of six and the kindling model of epilepsy was induced by intraperitoneal (IP) injection of PTZ (35 mg. kg) for a month. Except for the control and PTZ groups, three groups of rats received IP injections of fenoprofen 10, 20, and 30 (mg/kg) before each PTZ injection. One week after kindling development, the rats were challenged with PTZ (70 mg/kg). The shuttle box test was performed to evaluate their cognitive behaviors. Antioxidant and oxidative stress markers were measured in blood samples of rats. Nissl staining was performed in the hippocampal tissue of rats to investigate neuronal changes. The expression of Nrf2/Ho-1 genes was also measured in the hippocampus.
Results : Data analysis showed that fenoprofen delays the occurrence of convulsive behaviors and reduces its intensity. According to Nissl's staining results, fenoprofen reduces neuronal damage and decreases the number of dark neurons in the hippocampus tissue and it causes neuronal coherence in this area. In addition, the level of MDA, an oxidative stress marker, was significantly decreased in the treatment groups compared to the control or PTZ group, while the level of GPx showed a significant increase. The expression of Nrf2/Ho-1 genes in the groups treated with high doses of fenoprofen showed a significant increase compared to the saline and PTZ control groups.
Conclusion : According to the results, it seems that fenoprofen can play a role in the partial recovery of epilepsy by reducing neuroinflammation and oxidative stress, and by strengthening the Nrf2/Ho-1 signaling pathway, it prevents inflammatory reactions in the brain microenvironment.
Keywords : Epilepsy; Fenoprofen; Inflammation; Oxidative stress

Count: 209
Abstract ID: 643
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Low-Frequency Electrical Stimulation Reduces the Impairment in Synaptic Plasticity Following Epileptiform Activity in Rat Hippocampal Slices through α1, But Not α2, Adrenergic Receptors

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Background and Aim : Low frequency stimulation (LFS) has anticonvulsant effect and may restore the ability of long-term potentiation (LTP) to the epileptic brain. The mechanisms of LFS have not been completely determined. Here, we showed that LTP induction was impaired following in vitro epileptiform activity (EA) in hippocampal slices, but application of LFS prevented this impairment. Then, we investigated the involvement of α-adrenergic receptors in this effect of LFS.

Methods : EA was induced by increasing the extracellular K+ concentration to 12 mM and EPSPs were recorded from CA1 neurons in whole cell configuration.

Results : EA increased EPSP amplitude from 6.9 ± 0.7 mV to 9.6 ± 0.6 mV. For LTP induction, the Schaffer collaterals were stimulated by high frequency stimulation (HFS; two trains of 100 pulses, 100 Hz at the interval of 20 s). The application of HFS resulted in $40.9 \pm 2.3\%$ increase in the amplitude of EPSPs. However, following EA, HFS could not produce any significant changes in EPSP amplitude. Administration of LFS (1 Hz, 900 pulses) to Schaffer collaterals at the beginning of EA restored LTP induction to the hippocampal slices and HFS increased the EPSPs amplitude up to $41.7 \pm 3.1\%$ of baseline. When slices were perfused by prazosin (α1-adrenergic receptor antagonist; 10 μM) before and during LFS application, LFS improvement on LTP induction was reduced significantly.

Conclusion : Perfusion of slices by yohimbine (α2-adrenergic receptor antagonist; 5 μM) had no effect on LFS action. Therefore, it may be concluded that following epileptiform activity, LFS can improve the impairment of LTP generation through α1, but not α2, adrenergic receptor activity.

Keywords : Low frequency stimulation epileptiform activity adrenergic receptors

Count: 210
Abstract ID: 403
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Epilepsy Diagnosis and Seizure Localization using Resting State EEG Analysis and Machine Learning Approach

Submission Author: Alireza Fallahi

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Background and Aim : Epilepsy is a chronic neurological disorder that is characterized by seizure attacks and affects patients life in all ages [1]. Several methods have been proposed for diagnosing epilepsy and localizing seizure foci, and using EEG signals is one of the main methods [2]. The aim of this study is to automatically classify epileptic and healthy patients, as well as to localize the epileptic foci using resting state EEG signals.

Methods : Resting state EEG was recorded from 26 temporal lobe epilepsy patients and 20 healthy individuals were studied, which were used from the PhysioNet website [3]. According to the channels available in the data, Cz, P4, F8, and T7 are used for feature extraction and classification. The wavelet transform [4] and discrete cosine transform (DCT) [5] have been used for feature extraction from the EEG signals. The energy of the approximation coefficients of the wavelet transformation has been used as time-frequency characteristics as well and the DCT coefficients have been used as frequency characteristics. Support vector machine (SVM) [6] and multi-layer perceptron neural network (MLPNN) have been used to classify two groups of epileptic and healthy groups. In addition to using all channels for the classification of the two groups, each channel was also used individually for classification to determine the epileptic foci.

Results : The result of SVM classification accuracy for Cz, P4, F8, and T7 channels are 100%, 100%, 96.3%, and 96.3% respectively. Also, the classification accuracy results using all channels is 96.8% using SVM. Also, the classification results of MLPNN for Cz, P4, F8, and T7 channels

are 98.4%, 97.3%, 86.7%, and 83.5% respectively. Also, the result of classification using all channels is 94.6% using MLPNN.

Conclusion : Our findings show that the performance of the SVM classifier is better than MLP in classifying two groups of epileptic and healthy groups in all channels individually and also using whole channels. This is consistent with the findings of previous studies that found SVM more suitable for biological data. Also, F8 and T7 channels, which are related to temporal and frontotemporal regions, have better performance compared with Cz and P4 channels in both types of classifiers, which indicates that the seizer foci are related to these regions. These results indicated that temporal and frontotemporal regions were more related to seizure foci.

Keywords : Epilepsy; EEG; Machine learning; Classification

Count: 211
Abstract ID: 517
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Epilepsy Diagnosis and Seizure Localization Using Resting State EEG Signal and Time-Frequency Analysis

Submission Author: Alireza Fallahi

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Background and Aim : Epilepsy is a chronic neurological disorder that occurs as a result of dysfunction of some brain neurons and causes seizures [1]. Various methods have been proposed for diagnosing epilepsy, one of which is the use of EEG signals [2]. This study aims to automatically separate epileptic and healthy patients as well as to determine the epileptic foci by using resting EEG signals and statistical analysis techniques.

Methods : In this study, resting state EEG signals of 26 temporal lobe epilepsy patients and 20 healthy individuals were used, which were downloaded from the PhysioNet website [3]. According to the available channels in the data, Cz, P4, F8, and T7 channels were used for feature extraction. Wavelet transform [4] and discrete cosine transform (DCT) [5] have been used to extract features from the EEG signal. The energy of the first 5 approximation coefficients of the wavelet transform has been used as time-frequency characteristics and the first 5 coefficients of the DCT transform have been used as frequency characteristics. The statistical t-test was used to compare two groups of epileptic and healthy people. The t-test has been applied for each of the features and also in each channels.

Results : The results of statistical analysis for time-frequency characteristics show that there is a significant difference (p-value<0.05) between the two groups of healthy and epileptic people for the T7 channel in all characteristics. Also, for channels Cz, P4, and F8, there is a significant difference (p-value<0.05) between the two groups in features 3 to 5. In the DCT-based features,

channel T7 in the first three features and Cz, P4, and F8 channels only in the first feature show a significant difference (p-value<0.05) between the two groups.

Conclusion : The results show that the performance of time-frequency features in separating two groups of epileptic and healthy people is much better than frequency features. This is consistent with the findings of previous studies that found time-frequency features suitable for biological data classification. Also, the T7 channel, which is related to the temporal region, has better results compared with F8, Cz, and P4 channels in both types of features, which shows that the origin of seizures is related to this region.

Keywords : Epilepsy; EEG; Statistical analysis; Time- frequency features

Count: 212
Abstract ID: 162
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

The effect of pyridoxine supplementation with antiepileptic drugs on seizures, antioxidant levels and inflammatory factors in infant rat brain in maximal electroshock model

Submission Author: Morteza Fathi

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Background and Aim : Epilepsy is a developmental disorder in the central nervous system characterized by frequent seizures. The occurrence of these convulsions is at its highest throughout life, especially during infancy and childhood. Vitamin B6 is an exogenous antioxidant that can be consumed by infants and has the potential to prevent oxidative stress and inflammation. The effect of vitamin B6 supplementation on the anticonvulsant effect of carbamazepine and phenytoin were evaluated against maximal electroconvulsive therapy (MES) in neonatal rats.

Methods : Infant rats (25 to 30 g) received vitamin B6 (300, 600 mg/kg, intraperitoneally) one hour before challenged with (70 mA, 0.2 s) MES. In the other groups, carbamazepine or phenytoin (40 mg/kg, intraperitoneally) was administered alone or in combination with vitamin B6 one hour before the seizure challenge. Mortality rate and hindlimb extension (HLE) duration was recorded in all groups. Brain MDA and TNF-α level were determined after seizures in all groups.

Results : Vitamin B6 pretreatment alone or with anticonvulsant at all doses had no effect on mortality percent of rats. Vitamin B6 at a dose of 300 mg/kg could only significantly reduce the duration of HLE in MES seizures. Pretreatment with both doses of vitamin B6 significantly ($p<0.01$) enhanced the protective effect of phenytoin and carbamazepine (40 mg/kg) on MES seizures. A stronger suppressive effect ($p<0.01$) on the levels of MDA and TNF-? in the brain of seizures mice was observed in these concomitant administration. Taking supplements of vitamin B6 with the antiepileptic drugs can have several benefits for infants with epilepsy.

Conclusion : The effect of vitamin B6 treatment along with phenytoin and carbamazepine decreased the anticonvulsant effects of epilepsy.

Keywords : Maximal electroshock seizures, Vitamin B6, Rats, Carbamazepine, Phenytoin

Count: 213
Abstract ID: 61
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Examining the Relationship between Response Threshold to Electrical Stimulation and Sensitivity to Pentylenetetrazol Kindling in Male Rats

Submission Author: Nastaran RoshdRashidi

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Background and Aim : Previous studies have demonstrated that foot electrical stimulation has the potential to inhibit kindling development in rats. However, it remains unclear whether there is a relationship between the sensitivity to electrical stimulation and its inhibitory effect on kindling. Therefore, the aim of this study is to investigate the association between the response threshold to electrical stimulation and the susceptibility to pentylenetetrazol (PTZ) kindling in male rats.

Methods : Eighteen male Wistar rats were used in this research. For measuring the response threshold to electrical stimulation, rats individually received foot electrical stimulation with a frequency of 3 Hz and the initial current intensity was set at 0.1 milliamperes, and the current intensity was subsequently increased in steps of 0.1 milliamperes until the rat exhibited a noticeable sign of shock. For measuring the electrical resistance, Rats were placed on a metal grid, and voltmeter electrodes were placed on the grid between 5 and 10 cm from the animals. The electrodes were abandoned to stabilize for a few seconds. so that steady readings could be obtained. PTZ kindling was induced by injecting PTZ (37.5 mg/kg) 13 times at 48-hour intervals. The occurrences of seizure behaviors and their durations were recorded during kindling development and the different kindling stages were classified.

Results : According to the present DATA, there is a positive correlation between seizure parameters, Stage 2 latency ($p< 0.05$), Stage 5 latency ($p<0.05$), Stage 5 duration ($p<0.05$) and seizure stages ($p<0.05$) and the response threshold to electrical stimulation in male rats. Additionally, there was no significant relationship between the response threshold to electrical stimulation and the electrical resistance of the foot.

Conclusion : The absence of a significant correlation between the sensitivity to the response threshold of electrical stimulation and foot electrical resistance may suggest that other mechanisms, such as neuronal processes, could be involved in positive correlation between seizure parameters and response threshold to electrical stimulation.

Keywords : PTZ kindling; Response Threshold; Electrical Resistance

Count: 214
Abstract ID: 223
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

A worldwide of scientific status epilepticus: a machine learning and a bibliometric study

Submission Author: Rostam Seifadini

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Background and Aim : In both pediatric and adult populations, status epilepticus causes prolonged or recurrent seizures that, if untreated, can cause neuronal damage, severe disability, coma, and death.This study aims to draw a science map, provide structural analysis, explore the evolution, and determine new trends in research articles published in the field of SE

Methods : Relevant publications from 1961 to 2022 were obtained from the Web of Science, Scopus, and PubMed. After manual screening, R software was used to collect and analyze the acquired data.

Results : In this study, 759 articles were analyzed. In this descriptive analysis, 3846 keywords plus (ID) and 1190 author`s keywords (DE) are reported in journals. In addition, the articles reviewed by 3129 authors were published.

Conclusion : A very long seizure is known as status epilepticus (SE) and is taken to consideration a neurological emergency. The clinical manifestations of SE are variable. Physicians often use the term "condition" to describe episodes of generalized convulsive SE (tonic-clonic SE), but the clinical presentation of SE is common. Status epilepticus is associated with high mortality and predictors of poor neurological outcome. However, the contribution of long-term seizures to mortality and the causal relationship between neurological damage remains unclear. Early diagnosis and treatment of SE reduces patient complications, morbidity and mortality.

Keywords : bibliometrics, Status epilepsy, Mapping, biblioshiny , Machine Learning

Count: 215
Abstract ID: 24
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

Modulatory effect of exercise on reactive astrocytes in the somatosensory cortex of epileptic rats

Submission Author: Fariba Karimzadeh

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Background and Aim : Astrocytes as the most abundant brain cells play a variety of critical roles in neuroplasticity and normal brain function. Many epileptic patients show changes in astroglia morphology and function named reactive astrogliosis. The beneficial role of exercise has been reported in several studies. This study aimed to assess the effect of regular moderate exercise on astrocytes alteration followed by chronic seizures in the somatosensory cortex.

Methods : Male Wistar rats were divided into five groups: sham, pentylenetetrazole (PTZ), exercise (EX), EX before PTZ and EX + PTZ. Animals in the sham group received saline every other day for 4 weeks intraperitoneally (i.p.). Chronic seizures were induced by an i.p. injection of PTZ (35 mg/kg) every other day for 4 weeks. The protocol of exercise was running on a treadmill for 30 min/day 5 days a week at a mild intensity. The mean percentage of GFAP, C3 and S100A10 reacted astrocytes in the somatosensory cortex was assessed using immunohistochemistry.

Results : Our findings indicated that GFAP, as well as S100A10 expression, increased in the EX and the EX before PTZ group. The expression of the C3 receptor as a marker of neurotoxic astrocytes decreased in the three groups of exercise. In addition, the C3/S100A10 ratio in the somatosensory cortex decreased in the three groups of exercise.

Conclusion : Exercise would remodel astrocytes in the somatosensory cortex in favor of producing more neuroprotective astrocytes following the chronic seizure. Further, the improvement of neuroprotective astrocytes may be involved in the antiepileptogenesis effect of preconditioning exercise.

Keywords : Epilepsy; seizure; exercise; astrocyte

Count: 216
Abstract ID: 540
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Oral

Investigating the prediction of SAG voltage under harmaline toxicity in response to positive charge in intracellular recording data with the help of artificial intelligence

Submission Author: Zeinab Naseri

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Background and Aim : Harmaline is a natural alkaloid of Peganum harmala and Banisteriopsis caapi. It has been used for medicinal and spiritual purposes in some cultures. However, in high doses, harmaline can be toxic and cause various symptoms such as tremors, convulsions, and even death. The integration score of tremor under harmaline toxicity with SAG values and first spike latency data is a measure of the degree of correlation between these variables and their potential impact on the development and progression of tremor. In this paper, we investigate the ability of artificial intelligence (AI) to predict the SAG voltage of intracellular recording data under harmaline toxicity and two type treatments in response to positive charge.

Methods : We use intracellular recording data of rats' brain under harmaline toxicity in response to positive charge. This data includes recordings of 10 cell before harmaline toxicity as control, under harmaline toxicity and two systemic treatments. These systemic treatments include a CB receptor agonist (0.1, 0.5 and 1 mg kg−1 WIN55, 212–2) or two CB1 receptor antagonists (1 mg kg−1 AM251 and 10 mg kg−1 rimonabant) on tremor induced in rats by harmaline (30 mg kg−1; i.p.). We apply various AI-based regression methods to predict the 20% of recordings due to training the AI system with 80% of recordings. Also, we examine the prediction of -0.5v recordings due to -0.1v to 0.4v recordings. We investigate the potential of prediction of SAG voltage in control group, under harmaline toxicity and WIN55 and rimonabant treatments recordings. The AI-based regression methods that applied include support vector regression (SVR), Multilayer Perceptron (MLP), Stochastic Gradient Descent (SGD), Passive Aggressive Regressor and Random Forest (RF). Also, we examine Bayesian Ridge (BR) regression as a statistical method.

Results : The prediction of intracellular recordings in control group, under harmaline toxicity and WIN55 and rimonabant treatments with statistical and machine learning methods mentioned above are NOT meaningful.

Conclusion : The findings of this study to investigating the potential of AI-based methods for prediction of intracellular recordings in control group, under harmaline toxicity and WIN55 and rimonabant treatments show that the number of recordings are not informative enough and representative. By analyzing large amounts of data, these algorithms may uncover hidden patterns and provide insights that may not be immediately apparent to human researchers.

Keywords : harmaline toxicity, SAG voltage, rats, artificial intelligence, regression, prediction

Count: 217
Abstract ID: 418
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

Evaluation of the effect of Biocanin A on the salivary glands and oral mucosa of Mouse in Model of Demyelination (Multiple Sclerosis)

Submission Author: Fariba Abdal

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Background and Aim : Multiple sclerosis (MS) is an autoimmune disease characterized by demyelination of axons in the CNS. Complications caused by this disease, as well as the use of immunosuppressive drugs, antidepressants, etc., lead to various abnormalities. These drugs are prone to oral bleeding and are especially prone to infection. Among the main side effects of drugs in the oral cavity, we can mention stomatitis, ulcers, gums, candidiasis and some opportunistic infections (such as herpes simplex). Dentists should also be aware of the importance of this disease in the diagnosis, treatment and prognosis of some lesions as well as its special conditions. Therefore, in this study, the histopathological changes of oral mucosa and salivary glands in C57BL/6 demyelination mice (multiple sclerosis model) and biocanine drug were investigated.

Methods : This study was of animal type, and for this purpose, 28 male mice of C57BL/6 breed were used. Mice were randomly divided into 4 groups of seven, which include a healthy group or a sham group, a group receiving bucanin, a group receiving cuprizone, and a group receiving cuprizone and bucanin. And hematoxin and eosin staining to check the inflammation of salivary tissues, Trichrommason to check Collagen fibers and fibrosis of salivary tissues, immunohistochemistry was performed to check the amount of changes and tissue metaplasia. And the statistical analysis method was that all the values were presented in terms of SEM. The information obtained from the histological examination by paired T-test and The statistical method of one-way analysis of variance (ANOVA) and TUKEY test was performed by SPSS software. A significance level of $P<0.05$ was considered.

Results : Our findings show that demyelination in multiple foci of the brain and spinal cord leads to inflammation, atrophy, increased fibrosis and a large number of polymorphic cells in the main salivary gland. Parotid glands are associated with very severe inflammation in the course of MS. While sublingual glands are rarely involved in inflammation or metaplasia. Based on the findings of animal studies, we hypothesize that MS and the drug biocanine in humans may have an effect on the histological and physiological function of saliva and may lead to the early diagnosis of oral lesions and thus the treatment of these disorders.

Conclusion : Our conclusion is that MS and biocanine drug may be a risk factor for oral lesions such as inflammation, fibrosis and ulceration. These data show the pathological effect of demyelination on the area of acini and ducts in salivary glands.

Keywords : multiple sclerosis (MS), biocanine, inflammation, histology

Count: 218
Abstract ID: 629
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Cognitive Decline Prediction in Parkinson's Disease: A Hybrid Machine Learning Approach using Clinical and DAT SPECT Imaging Features

Submission Author: Ali FathiJouzdani

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Background and Aim : We aimed to predict Montreal Cognitive Assessment (MoCA) scores in Parkinson's disease patients at year 4 using handcrafted radiomics (RF), deep (DF), and clinical (CF) features at year 0 (baseline) applied to hybrid machine learning systems (HMLSs).

Methods : 297 patients were selected from the Parkinson's Progressive Marker Initiative (PPMI) database. The standardized SERA radiomics software and a 3D encoder were employed to extract RFs and DFs from single-photon emission computed tomography (DAT-SPECT) images, respectively. The patients with MoCA scores over 26 were indicated as normal; otherwise, scores under 26 were indicated as abnormal. Moreover, we applied different combinations of feature sets to HMLSs, including the Analysis of Variance (ANOVA) feature selection, which was linked with eight classifiers, including Multi-Layer Perceptron (MLP), K-Neighbors Classifier (KNN), Extra Trees Classifier (ETC), and others. We employed 80% of the patients to select the best model in a 5-fold cross-validation process, and the remaining 20% were employed for hold-out testing.

Results : For the sole usage of RFs and DFs, ANOVA and MLP resulted in averaged accuracies of 59 ± 3% and 65 ± 4% for 5-fold cross-validation, respectively, with hold-out testing accuracies

of 59 ± 1% and 56 ± 2%, respectively. For sole CFs, a higher performance of 77 ± 8% for 5-fold cross-validation and a hold-out testing performance of 82 + 2% were obtained from ANOVA and ETC. RF+DF obtained a performance of 64 ± 7%, with a hold-out testing performance of 59 ± 2% through ANOVA and XGBC. Usage of CF+RF, CF+DF, and RF+DF+CF enabled the highest averaged accuracies of 78 ± 7%, 78 ± 9%, and 76 ± 8% for 5-fold cross-validation, and hold-out testing accuracies of 81 ± 2%, 82 ± 2%, and 83 ± 4%, respectively.

Conclusion : We demonstrated that CFs vitally contribute to predictive performance, and combining them with appropriate imaging features and HMLSs can result in the best prediction performance.

Keywords : Montreal Cognitive Assessment; deep learning; hybrid machine learning systems; Radiomics; Parkinson’s disease

Count: 219
Abstract ID: 202
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Phase-Dependent Coding in the Inferotemporal Cortex

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Background and Aim : The inferotemporal cortex (IT) of primates plays a fundamental role in object recognition. However, instances of neurons in the IT cortex showing similar firing rates for distinct objects raise questions about the completeness of rate-based coding models. If firing rates alone were the primary mechanism of discrimination, this observed similarity could pose challenges to an animal's ability to differentiate between objects. Given this conundrum, we hypothesize that beyond firing rates, the phase of spikes might offer a layer of discriminatory information, allowing for finer object differentiation.

Methods : Utilizing MATLAB, we processed spike and local field potential (LFP) data obtained from the IT cortex of macaque monkeys. Visual stimuli, categorized into faces, bodies, fruits, and objects, were presented, and the corresponding neural responses were analyzed. When rate similarities were identified through post-stimulus time histograms (PSTH), we calculated the phase information from the wavelet transformation of the LFP data. For neurons showing similar firing rates across conditions, we assessed the potential phase differences in their spikes. The D prime metric, indicative of the different phase responses between conditions, was computed across a frequency spectrum.

Results : Although numerous pairs of stimuli showed strikingly similar firing rates, an analysis of the phase data revealed marked disparities in their spike timings. The computed D prime values demonstrated significant phase-based differences, suggesting that even when firing rates are similar, the phase of the spikes might convey crucial discriminatory information.

Conclusion : This study underscores the importance of phase-dependent neural encoding in the IT cortex of macaque monkeys. While firing rates provide an initial layer of neural coding, the phase of spikes may offer a supplementary dimension, allowing primates to differentiate between objects with higher precision. This phase-based approach paves the way for a more comprehensive understanding of neural coding mechanisms in object recognition.

Keywords : Inferotemporal Cortex; Object Recognition; Neural Encoding; Spike Phase; Firing Rate

Count: 220
Abstract ID: 370
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

Artificial Intelligence in deep brain stimulation: A systematic review

Submission Author: Niloufar Delfan

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Background and Aim : Deep Brain Stimulation (DBS) has emerged as a widely used therapeutic approach for a diverse array of neurological disorders, particularly those associated with abnormal movement. Over the past few decades, the effectiveness of DBS in alleviating patient symptomatology has driven a surge in its application. Simultaneously, the realm of artificial intelligence (AI) has experienced a remarkable ascent, extending its influence into various medical domains, including neurosurgery. Despite the growing interest in AI's potential within this field, a dedicated literature review on the utilization of AI in DBS has been notably absent.

Methods : Our approach to compiling this review followed a rigorous and systematic methodology, involving the collection and analysis of 90 pertinent research papers. Within each paper, we meticulously identified key aspects, including the clinical application of AI in DBS, the type and volume of data employed, the specific methods applied, and the validation strategies utilized. These validation strategies were further categorized into 12 distinct sub-categories. The collective findings from these papers unveiled prominent trends in how AI is leveraged in the context of DBS. These trends encompass the breadth of problem domains addressed, the evolution of techniques, common frameworks, and existing limitations.

Results : This systematic review offers a comprehensive examination of how AI has been recently harnessed to tackle clinical challenges within the realm of DBS. It provides valuable insights into how these innovative computational approaches are advancing the frontiers of functional neurosurgery. The application of AI in DBS is diverse and multifaceted, spanning a wide range of

neurological conditions. Researchers have employed various forms of data, including neuroimaging, electrophysiological recordings, and clinical patient data, to optimize the outcomes of DBS interventions. Machine learning techniques, such as deep learning, reinforcement learning, and data-driven modeling, have been utilized to interpret complex data and inform decision-making in DBS procedures. These AI-driven approaches offer the potential to enhance the precision and efficacy of DBS therapy, leading to improved patient outcomes. However, despite the promise of AI in DBS, several challenges and limitations persist. Ethical and regulatory considerations in implementing AI within clinical practice must be addressed. Data privacy, model interpretability, and the need for transparent decision-making processes are critical issues that require ongoing attention. Additionally, the generalizability of AI models across diverse patient populations and the interpretability of AI-generated insights remains areas of active research and development.

Conclusion : The clinical workflow of DBS is intricate, involving multiple specialists and presenting various clinical challenges. AI has made significant strides in addressing some of these challenges. However, it is important to recognize that the areas addressed with machine learning are not considered fully "solved" by the medical community. The field of AI in DBS continues to evolve, offering potential solutions to complex clinical problems while generating new challenges that require ongoing exploration and innovation. The integration of AI into DBS represents a promising frontier in the advancement of functional neurosurgery, with the potential to improve patient care and outcomes.

Keywords : Deep Brain Stimulation; Artificial Intelligence; Neurological Disorders

Count: 221
Abstract ID: 612
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

The Effects of Transcranial Direct-Current Stimulation (tDCS) on Pain Intensity of Patients with Fibromyalgia: A Systematic Review and Meta-Analysis

Submission Author: Kiarash Kavari

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Background and Aim : -Fibromyalgia (FM) is a chronic pain condition that affects millions of people worldwide. Transcranial Direct Current Stimulation (tDCS) is a non-invasive brain stimulation technique that has shown promise as a potential treatment for FM by modulating pain perception and reducing symptoms, such as fatigue and depression. We aimed to systematically review studies that assess the effect of tDCS on pain reduction in FM patients.

Methods : -Seven electronic databases (PubMed, Scopus, Embase, PsycINFO, Web of Science, Cochrane, and CINAHL Complete) were searched for records in English. Studies that measured the effect of tDCS on pain intensity in FM patients were included. The Cochrane Collaboration's tool was used to assess the quality of the included studies. A random-effect model was preferred, and statistical analysis was performed by Stata software version 17.

Results : -Twenty studies were included for qualitative, and eleven for quantitative analysis. Out of 664 patients included in the study, 443 were in the stimulation group. The left M1 area was the most common stimulation target (n=12), and 2 mA was the most common stimulation amplitude (n=19). The analysis showed that active tDCS significantly reduced pain intensity in FM patients in comparison to the sham group (SMD= -1.55; 95% CI -2.10, -0.99); also, no publication bias was noted.

Conclusion : Our systematic review highlights the potential effect of tDCS on the reduction of pain intensity in FM patients. Additionally, this current evidence could suggest that tDCS applied at an intensity of 2mA to the left M1 is the most effective strategy.

Keywords : Fibromyalgia, tDCS, Pain, Transcranial Direct Current Stimulation, Noninvasive brain stimulation

Count: 222
Abstract ID: 5
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

Reading and phonological awareness improvement accomplished by transcranial direct current stimulation combined with phonological awareness training: A randomized controlled trial

Submission Author: Seyyedehsamaneh Mirahadi

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Background and Aim : Phonological awareness (PA) training is a core intervention in dyslexia. Recently, transcranial direct current stimulation (tDCS) has been probed as a complementary intervention for increasing reading ability in dyslexia, but not for enhancing the efficacy of PA. The aim of the current study was thus to examine whether tDCS combined with a PA intervention improves reading, but also PA abilities as a proxy in children with dyslexia.

Methods : A randomized, double-blind, sham-controlled clinical trial was performed to assess the effects of tDCS (applied bilaterally over the temporo-parietal junction with the anode placed over the left, and the cathode placed over the right hemisphere) combined with PA training on reading and PA abilities in dyslexic patients. Twenty-eight participants were randomly assigned to active (PA + anodal tDCS) or sham (PA+ sham tDCS) groups. Each subject participated in 15 treatment sessions. PA and high frequency and low frequency word reading and non-word reading were evaluated at baseline before the intervention, at the end of the fifth, tenth, and final intervention sessions, and then 6 weeks after intervention. For the time course of the outcome variables, mixed-model ANOVAs with the between subjects factor group (anodal and sham tDCS interventions) and the within-subjects factor time (T1–T5) were conducted to compare the variables between groups over time. In case of significant time and group interactions, post-hoc Student's t-tests (Bonferroni-corrected) were conducted to examine significant differences at each time point between the two groups. To calculate the effect size, partial eta squared was determined. In all analyses, critical $p < 0.005$ and $p< 0.01$ were considered statistically significant for within and between group comparisons, respectively

Results : Primary outcome measure (high frequency word (HFW) and low frequency word (LFW) reading and non-word reading (NW)): The results revealed a significant main effect of time for all outcome parameters ($p < 0.001$), but no significant main effect of group was found for all outcome parameters ($p > 0.05$) The results showed moreover a significant interaction between group and time for LFW ($p = 0.016$) and NW reading ($p < 0.001$). Comparisons of the two groups for each time point revealed no significant differences for HFW and LFW, but for NW, the between-group differences of adjusted means at T3, T4 and T5 from baseline (T1) were significantly larger in the active group. Secondary outcome measures (rhyme detection, phoneme blending, and phoneme deletion tests): the mixed model ANOVA resulted in a significant main effect of time for all outcome parameters ($p < 0.001$). But no significant main effect of group was found for rhyme detection and phoneme blending ($p > 0.05$). The only significant main effect of the group was for phoneme deletion ($p = 0.013$). A significant interaction effect between group and time for rhyme detection ($p = 0.006$) and phoneme deletion ($p = 0.014$) was found. Between group comparisons based on differences of adjusted means at T2–T5 from baseline (T1) for each outcome variable revealed that for rhyme detection the between-group differences of adjusted means at T4 and T5 from baseline (T1) were significantly larger in the active group

Conclusion : tDCS is thus a promising complementary intervention if combined with PA training to enhance PA and reading abilities in dyslexia for an extended period after treatment.

Keywords : Dyslexia; grapheme to phoneme correspondence; phonological awareness; transcranial direct current stimulation

Count: 223
Abstract ID: 6
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Oral

Impact of Phonological Awareness Intervention Combined with Transcranial Direct Current Stimulation on Rapid Automatized Naming and Verbal Short Term Memory in developmental dyslexia: A Randomized Cont

Submission Author: Seyyedehsamaneh Mirahadi

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Background and Aim : Dyslexia is a multi-dimensional neurodevelopmental disorder characterized by difficulties in accuracy, fluency and comprehension of reading. One core symptom of dyslexia is phonological deficits. These include deficits in phonological awareness (PA), rapid automatized naming (RAN), and verbal short-term memory (VSTM). While PA training is the primary treatment for dyslexia, transcranial direct current stimulation (tDCS) has recently been introduced as a complementary treatment in combination with PA intervention to enhance treatment efficacy.

Methods : We conducted this study to evaluate the effects of combined PA/tDCS intervention to improve RAN and VSTM. In this randomized, double-blind, sham-controlled clinical trial, we included a PA+sham tDCS group (sham group) and a PA+ active tDCS group (active group) in which we applied tDCS over the left parieto-temporal junction. Twenty-eight dyslexic students were randomly allocated to the groups of active (PA+anodal tDCS) or sham (PA+sham tDCS) intervention. Each volunteer participated in 15 intervention sessions. RAN (evaluated by RAN_objects and RAN_letters) and VSTM [evaluated by digit span and non-word repetition (NWR) tests] were assessed at baseline before intervention, at the end of the fifth, tenth, and final treatment session, and finally 6 weeks after treatment. Between-group comparisons of the demographic variables were performed by Student's t-tests for quantitative variables and Fisher's exact test for the qualitative variable. Data of the two groups over time were analyzed by a mixed model analysis of variance (ANOVA) with the between-subject factor group (active and sham tDCS treatments) and the within-subject factor time (T0-T4). In all ANOVA analyses, $p < 0.05$

was considered as statistically significant. If the results of the ANOVA showed significant main effects or time × group interactions, exploratory post hoc Fisher´s LSD tests") were used to examine significant differences at each time point within and between the two groups

Results : The mixed model ANOVA showed a significant main effect of time for all outcome measures ($p<0.001$), exept for BDS ($p=0.075$). No significant main effect of group and time × group interaction emerged for all outcome measures ($p > 0.05$), except for RAN_letters ($p=0.004$). Within-group comparisons revealed significant differences of the means at T1-T4 from the pre-test (T0) values at the majority of time points in each group. Between group comparisons were not performed due to the non-significance of the main effect of group, and the time × group interaction for all outcome measures, except for RAN_letters. Between group comparisons for RAN_letters did not show significant differences ($P>0.05$).Combined intervention (PA+ tDCS) had no further effect on outcome measures than PA intervention alone.

Conclusion : PA intervention has an improvement effect on other phonological skills (RAN and VSTM). Anodal tDCS over the left parieto-temporal area during the behavioral intervention had no further therapeutic effect on these skills in the present study.

Keywords : Phonological Awareness, Rapid Automatized Naming, Verbal Short-Term Memory, Transcranial Direct Current Stimulation, Dyslexia

Count: 224
Abstract ID: 472
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

Transcranial Alternating Current Stimulation (tACS) as novel treatment options for insomnia: A systematic review

Submission Author: Jaber Alizadehgoradel

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Background and Aim : Despite the success of cognitive behavioural therapy for insomnia and recent advances in pharmacotherapy, many patients with insomnia do not sufficiently respond to available treatments. Transcranial alternating current stimulation (tACS) was recently used as a therapeutic application in patients with insomnia. This systematic review aims to present the state of science regarding the use of brain tACS in treating insomnia.

Methods : I searched four main electronic databases to identify studies until November 2023. Our search identified 6 controlled trials that met inclusion criteria, and assessed a total of 175 participants using Transcranial alternating current stimulation.

Results : The results identified the simultaneously and bilaterally at F3/M1 and F4/M2, Target (Fpz, Fp1, Fp2) Return (M1, M2), A(F3, F4) C(M1, M2), targeting the forehead and both mastoid areas. Although different areas of the brain have been stimulated, the results of studies have shown significant improvement.

Conclusion : The findings show that the tACS has potential as an effective and safe intervention for insomnia.

Keywords : Insomnia; Transcranial alternating current stimulation (tACS), systematic review

Count: 225
Abstract ID: 637
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

AI-Nano-Neuro Brain Interfaces: A Promise for Brain Communication, Disease detection, and Improvement

Submission Author: Nasibeh Rady Raz

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Background and Aim : Neurodegenerative diseases are types of disorders in which death or deterioration happens to the cells of the central nervous system (CNS) in a way that they lose their proper function. Early detection and application of proper therapy are a need. Artificial intelligence (AI) is a proper tool for performing early detection and nano neurotechnology is an effective therapeutic platform. In this paper, we review several AI-Nano-Neuro brain interfaces for detecting and therapy brain disease.

Methods : Brain interfaces and brain-reading devices using artificial intelligence, nanotechnology, and neuro-engineering, help paralyzed people to move, talk and touch. For example, implantable brain-machine interface devices make it possible to interface directly with brain cells for paralysis to use machines and prosthetic limbs. Also, wearable brain-sensing devices for monitoring EEG signals with the help of AI for performing medical brain scans are presented. Furthermore, a device that translates signals from the visual cortex into digital commands is presented for controlling computers with brain signals. Moreover, the neuroprosthetic device maintains blood pressure after spinal cord injury. Brain implant also restores the paralyzed sense of touch. Furthermore, an artificial intelligence model using nocturnal breathing signals is used to detect Parkinson's disease and track its progression. Also, to pave the way for improving the foundation for AI-Nano-Neuro brain interfaces, there is a change in capturing electrical brain activity from invasive methods to less invasive methods such as near-infrared spectroscopy for detecting changes in the blood flow in the brain using light.

Results : Considering AI for controlling and neuro nanotechnology for compatible therapeutic devices, great achievements happened in brain-related disease detection and therapy.

Conclusion : Early detection and effective compatible intervention are key in brain disease therapy and detection. Artificial intelligence (AI), nanotechnology, and neuro-engineering are important tools for this aim. This paper reviews several state-of-the-art AI-Nano-Neuro brain interfaces for detecting and therapy brain disease.

Keywords : Artificial Intelligence; Blood-Brain Barrier; Biomimicry; Drug Delivery

Count: 226
Abstract ID: 197
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

Evaluation and diagnosis of multiple sclerosis using retinal images with the help of artificial intelligence

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Background and Aim : Multiple sclerosis (MS) is a common autoimmune and inflammatory disorder that causes demyelination and neuronal changes in the central nervous system (CNS). The eye is one of the organs of the body that is affected by MS, especially the layers of the retina and the optic nerve, which are affected. Optical coherence tomography (OCT) images can play a key role in the preliminary stages. After analyzing the images, artificial intelligence can automatically diagnose MS in the early stages.

Methods : In total, about a thousand images of the retina of sick people and healthy people were included in this study, and the OCT images of the retina were taken without noise, and then using data augmentation, artificial intelligence and neural networks were trained with the images taken. Finally, the automatic detection algorithm of MS disease was implemented in Python, and then the diagram of retinal loss processes was drawn and the sensitivity, specificity and accuracy of the algorithm were evaluated.

Results : The disease was successfully diagnosed by OCT images with an accuracy of 96.0.

Conclusion : The proposed method, as a complement to other diagnostic methods, will cause a quick diagnosis of the disease with the lowest cost and the highest accuracy and sensitivity, and will improve the treatment process of the patient.

Keywords : convolutional neural network, multiple sclerosis, optical coherence tomography, retinal layer thickness.

Count: 227
Abstract ID: 66
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

Personalized 3D-Printed Skull Prosthesis by Polyether Ether Ketone after Neurological Surgery

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Background and Aim : The complex shapes in craniofacial region make bone reconstructions a challenging procedure. Due to need for esthetic and functional flap, the most suitable material to be used remains controversial.

Methods : We report a series of 22 patients whose craniofacial defects were reconstructed using a computer designed Polyether ether ketone (PEEK). We analyzed the complications and outcomes during mid-term follow up.

Results : 22 patients underwent craniofacial reconstruction using a PEEK. Two cases (10.8 %) presented infection. Esthetic results were considered to be highly satisfactory in 94.2% of patients. In one patient who had not satisfied results, the interval of previous cranial surgery and PEEK insertion was over three years.

Conclusion : When autologous bone is unavailable or, in selected cases with large or complex defects in the maxillofacial area, PEEK is one of the best options to reconstruct these defects. However, further studies are needed to determine the long-term results.

Keywords : Craniofacial, Cranioplasty, Implant, Reconstruction

Count: 228
Abstract ID: 65
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

Using Microsoft HoloLens 2 for fast and accurate neurosurgery planning

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Background and Aim : Augmented reality (AR) is a technology that projects virtual content into the real environment. AR has been increasingly used in neurosurgery for various purposes, such as spine surgery, neuronavigation, education and surgical planning. According to a systematic review, the number of AR applications in neurosurgery has grown in the last 10 years, especially in North America, Europe and China. However, there are still technical and human challenges to overcome before AR becomes widely adopted in clinical practice.

Methods : We developed a novel method for using Microsoft HoloLens 2 in neurosurgery. Our method involves importing dicom data of patient's MRI and CT images, including vascular windows, into an application that is a module of 3D slicer. This application allows us to reconstruct and segment different layers of the patient's anatomy, such as skin, bone, brain, tumor and vasculature, using artificial intelligence techniques. We can also adjust the segmentation and reconstruction parameters manually if needed. After this step, the 3D layers are automatically imported into the HoloLens, where we can plan the surgery by creating custom sections of the layers using various tools, such as cone, sphere or cube. These sections help us to visualize the microscopic approach and the removal of skin and bone. We can also change the position of the patient's hologram to find the optimal surgical approach. Finally, we register the planned

holograms on the patient's real anatomy by matching the point clouds extracted from the depth sensor and the patient's 3D face.

Results : We achieved less than 30 min segmentation, reconstruction and co-registration. We achieved an accuracy of 5-10 mm for hologram registration. We achieved HoloLens app environment learning in less that 5 minutes. We achieved full planning and registration in less than 15 minutes.

Conclusion : In this paper, we presented a novel method for using Microsoft HoloLens 2 in neurosurgery. Our method allows us to import, segment, reconstruct and register patient's MRI and CT images in the HoloLens, and to plan the surgery by creating custom sections of the patient's anatomy. Our method is fast, accurate and easy to learn. We believe that our method can improve the efficiency, safety and outcome of neurosurgery by providing a realistic and interactive visualization of the patient's condition and the surgical approach.

Keywords : Augmented reality, Neurosurgery, Preoperative planning

Count: 229
Abstract ID: 67
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Thymol has anticancer effects in U-87 human malignant glioblastoma cells

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Background and Aim : Thymol (2-isopropyl-5-methylphenol) is a colorless crystalline derivative of cymene, that possesses pleotropic pharmacological properties, including analgesic, antibacterial, antispasmodic, and anti-inflammatory activities. Thymol has also been recognized for its beneficial effect as an anti-tumor agent, but the precise mechanism for this has not been fully elucidated. We aimed to identifying whether thymol exerts anti-cancer activity in human U-87 malignant glioblastoma (GB) cells (U-87)

Methods : Cell viability and apoptosis was evaluated in U-87 cells treated with thymol at different concentrations. Reactive oxygen species (ROS) production, mRNA expressions of apoptosis-related genes and cell cycle characteristics were assessed. The cytotoxic activity of the co-exposure of thymol and temozolomide (TMZ) was also evaluated. The half maximal inhibitory concentration (IC50) of thymol in the U-87 cells was 230 μM assessed at 24 h after exposure.

Results : Thymol did not exhibit any cytotoxic effects on normal L929 cells at this concentration. Thymol treatment increased the expression of Bax and p53, and also increased apoptotic cell death, and excessive generation of ROS. Moreover, the cytotoxic activity of thymol on the U-87 cells may be related to the arrest of the cell cycle at the G0/G1 interface. Combination therapy showed that the cytotoxic effects of thymol synergized with TMZ, and combined treatment had more cytotoxic potential compared to either of the agents alone.

Conclusion : Our data indicate the potential cytotoxic activities of thymol on U-87 cells. Further studies are required to evaluate the spectrum of the antitumor activity of thymol on GB cells.

Keywords : Thymol ; Apoptosis ; Cell cycle arrest ; ROS ; Glioma

Count: 230
Abstract ID: 68
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Safety of dual antiplatelet therapy in the acute phase of aneurysmal subarachnoid hemorrhage: a propensity score–matched study

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Background and Aim : With the evolution of neuro endovascular treatments, there is a great trend to treat acutely ruptured wide necked aneurysms with stent assisted coiling (SAC) and flow diverters (FDs), which inevitably requires dual antiplatelet therapy (DAPT). This therapy can increase the rate of hemorrhagic complications following other neurosurgical maneuvers, such as external ventricular drain (EVD) placement or removal. In this study, the authors aimed to evaluate the safety of DAPT in patients with aneurysmal subarachnoid hemorrhage (SAH) treated with SAC or FDs and the therapy's potential benefit in reducing cerebral ischemia and cerebral vasospasm.

Methods : In this retrospective study, the authors reviewed the records of patients who had been admitted to their hospital with acute aneurysmal SAH and treated with SAC, FDs, and/or coiling between 2012 and 2022. Patients were classified into two groups: a DAPT group, including patients who had received DAPT for SAC or FDs, and a non-DAPT group, including patients who had not received any antiplatelet regimen and had been treated with coiling. Perioperative hemorrhagic and ischemic complications and clinical outcomes were compared between the two groups.

Results : From among 938 cases of acute ruptured aneurysms treated during 10 years of study, 192 patients were included in this analysis, with 96 patients in each treatment group, after propensity score matching. All basic clinical and imaging characteristics were equivalent between

the two groups except for the neck size of aneurysms ($p < 0.001$). EVD related hemorrhage was significantly higher in the DAPT group than in the non-DAPT group ($p = 0.035$). In most patients, however, the EVD related hemorrhage was insignificant. Parent artery or stent-induced thrombosis was higher in the DAPT group than in the non-DAPT group ($p = 0.003$). The rate of cerebral ischemia was slightly lower in the DAPT group than in the non-DAPT group (11.5% vs 15.6%, $p = 0.399$). In the multivariate analysis, cerebral ischemia, re bleeding before securing the aneurysm, extracranial hemorrhage, and cerebral vasospasm were the predictive factors of a poor clinical outcome ($p < 0.001$, $p < 0.001$, $p = 0.038$, and $p = 0.038$, respectively)

Conclusion : The DAPT regimen may be safe in the setting of acute aneurysmal SAH. Although EVD-related hemorrhage is more common in the DAPT group than the non-DAPT group, it is usually insignificant without any neurological deficit

Keywords : subarachnoid hemorrhage; ruptured aneurysm; dual anti platelets; stent-assisted coiling; flow diverter

Count: 231
Abstract ID: 365
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Medicinal plants used in epilepsy

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Background and Aim : -Epilepsy is a common central nervous system (CNS) disorder and the fourth leading cause of neurological disease worldwide. This disease is mainly associated with frequent seizures. Epilepsy attacks can be generalized and focal. Epilepsy may cause anxiety, depression, cognitive decline, schizophrenia, which can worsen the quality of life and increase the incidence of death in patients. Epilepsy can be caused by genetics or brain damage due to tumor, injury, stroke, infection, etc. According to the WHO, in 2023, approximately 50 million people worldwide will suffer from the symptoms of epilepsy. It has been reported that almost 80% of epilepsy cases are in low and middle income countries, due to the lack of anti-epileptic drugs (AEDs) and high costs and less side effects than chemical drugs, efforts have always been made to find more effective and efficient drugs. . Therefore, in this article, we reviewed medicinal plants effective on epilepsy with emphasis on the mechanism of action and pathophysiology

Methods : -In this study, from reliable scientific databases such as Google Scholar, PubMed, plantlist.org, SID by entering epilepsy, medicinal plants, brain, neuron, GABA, drugs effective on epilepsy in animal models with emphasis on the discussed mechanism of action and The review was placed.

Results : -Our searches revealed that there are herbs with scientific names such as Datura stramonium from (potato family), Matricaria Chamomilla, Camellia sinensis, Anethum graveolens, Sesbania grandiflora, lavandula officinalis, salvia sahendica, Ferulago, Centella asiaticaen, etc., which are effective. that we have introduced the number of 15 plants studied in recent years with the mechanism of action. By affecting GABA receptors, glutamate, calcium channels, sodium and chloride channels, as well as by reducing oxidative stress, they inhibit convulsive activities. Most herbal anti-epileptic drugs block the release of excitatory

neurotransmitters such as glutamate. Or by increasing the release of inhibitory neurotransmitters such as GABA, they reduce nerve excitability. The mechanism of some herbal medicines involves targeting ion channels, namely Na+ and Ca2+ channels, which have a delayed onset of effect. In animal models, these plants have shown an effective effect on epilepsy.

Conclusion : Today, due to the side effects of chemical anti-epileptic drugs, drug resistance, especially its 30% resistance in children, high cost, decrease in its acceptance among the people, and lack of access to the drug, the use of medicinal plants has become the focus of everyone. to be placed Therefore, medicinal plants can be a good alternative to chemical drugs to prevent epilepsy.

Keywords : epilepsy, medicinal plants, brain, neuron, GABA, drug

Count: 232
Abstract ID: 130
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Neuroprotective effects of carvacrol against Alzheimer's disease: A review

Submission Author: Zahra Azizi

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Neurodegenerative diseases are considered an important cause of cognitive deficit and morbidity in old ages. Alzheimer's disease (AD) is one of these disorders affecting about 40 million people in the world at the present time. Available drug therapy is mostly symptomatic and does not modify or stop disease progression. Recently, biologically active chemicals from herbs have been studied to develop new therapeutic drugs. Carvacrol (5-isopropyl-2-methylphenol) a natural monoterpenoid phenol is one of the major constituents in the essential oil of several aromatic plant including Thymus, Origanum and Zataria. This compound is expected to have the ability to affect AD pathogenesis and therefore, it is considered an anti-AD agent. This review was conducted using PubMed, Google Scholar and Science Direct bibliographic databases until May 2023. For data collection, the following keywords were used: carvacrol, neuroprotective, cognition, anti-inflammatory, antioxidant, acetylcholinesterase inhibitor, and Alzheimer's disease. The search strategy design was including all available literature evaluating carvacrol with at least one of the above keywords. In most cases, the original full-text articles were obtained and appropriate data was extracted. The search was limited to English language. We gave an overview of available literature concerning protective potential of carvacrol in Alzheimer's disease and various underlying mechanisms, such as anti-inflammatory, antioxidant, and anticholinesterase effects. Extensive researches have revealed that carvacrol neuroprotective properties could be useful in ameliorating Alzheimer's disease. Taken together, available literature suggests that carvacrol might be a potentially valuable therapeutic agent for neuroprotection and cognitive function improvement, which may be due to its multifunctional activities including antioxidant and anti-inflammatory, and AChEI properties. However, despite the variety of mechanistic studies on the neuroprotective activity of carvacrol, lack of clinical trials on the therapeutic effects of carvacrol is an important limitation that can be noted. Therefore, an accurate strategy for carvacrol administration should be designed to investigate the effect of carvacrol on early stage of Alzheimer's disease. So, further studies are needed to define its clinical efficiency, before recommending its use as a therapy for any disease.

Keywords : Carvacrol; Alzheimer's disease; Neurodegenerative; Neuroprotection.

Count: 233
Abstract ID: 588
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

safety and efficacy of Ocrelizumab for progressive multiple sclerosis: A systematic review

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Background and Aim : -Progressive multiple sclerosis (PMS) is a debilitating condition characterized by progressively worsening symptoms. Monoclonal antibodies are up to date therapies for MS, but yet have not been extensive studied their safety and efficacy in the progressive form. we aimed to evaluate the obtainable evidence regarding Ocrelizumab as a monoclonal antibody treatment for PMS In this systematic review.
Methods : -we systematically searched three major databases for clinical trials relate to Ocrelizumab administration for PMS treatment. All the retrieved results were imported into the EndNote reference manager. After removing the duplicates, two independent researchers did the study selection and data extraction. The risk of bias was assessed using the JBI checklist and overall quality of studies was high
Results : -Of the 1846 studies in the preliminary search, 8 clinical trials investigating Ocrelizumab in PMS patients were included. studies investigating Ocrelizumab in patients with PPMS recommend that the treatment effectively reduces disability progression decreases the risk of confirmed expanded disability status scale (EDSS) ≥ 7, reduces disability progression, and improves upper extremity impairment. Early initiation of treatment is associated with greater benefits. IRRs were mild to moderate and could be controlled. Common infections were nasopharyngitis, influenza, and urinary tract infection. Additional research is needed to further evaluate long-term safety and efficacy.
Conclusion : Ocrelizumab is efficient monoclonal antibody for primary PMS, Based on our findings although it has association with a higher risk of infection
Keywords : Monoclonal antibody, Ocrelizumab ,Progressive multiple sclerosis

Count: 234
Abstract ID: 289
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Poster

Evaluation of correlation between apolipoprotein E (ApoE) genotype & cognitive outcomes in multiple sclerosis;our experience & a systematic review & meta-analysis

Submission Author: SEYEDEMAD SEYEDGHOLAMYSHARABIANI

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Background and Aim : Cognitive impairment (CI) is one of running symptoms of multiple sclerosis (MS)that fails to care for. Apolipoprotein E (ApoE) is a genetic factor that links to human cognition. We are going to look for the role of ε4 isoform of ApoE (ApoE4) in CI in MS patients with aggregation our experience and meta-analysis.

Methods : in our cross-sectional study adult (18+) mildly disabled expanded disability status scale (EDSS score<4) relapsing-remitting MS (RRMS) patients based on 2017 revised MacDonald criteria that conducted by the Minimal Assessment of Cognitive Function in MS (MACFIMS) battery(neurocognitive assessment). patients were split into two groups of ApoE4-positive and ApoE4-negative groups After determining the genotype and the we evaluate the association between ApoE4 and . Also in our systematic review and meta-analysis study After registration of the study protocol in PROSPERO ,had searched Medline via PubMed, Scopus, and ISI web of science after screening stages and excluding Animal studies, conference abstracts, reviews, clinical trials, case reports, letters and withdrawn studies, Risk of bias was assessed using the Joanna

Briggs Institute (JBI) critical appraisal tools and the meta-analysis was conducted with Comprehensive Meta-Analysis (CMA.2) software.

Results : 71 patients (mean age of 31.43±8.75) were involved and no significant difference observed in rate of overall (CI) (p=0.75).But in the other hand in 11 out of 17 ApoE4-positive(64.70%) patients and in 16 out of 54 ApoE4-negative group (29.62%) observed at least one impaired test (p<0.01). In detailed investigation of the components of the battery. The mean scores of MACFIMS battery tests in the ApoE4-negative group were better than the ApoE4-positive group in all of the tests. Impairment in Paced Auditory Serial Addition Test (PASAT) task and also the mean score of Brief Visuospatial Memory Test-Revised (BVMT-R) tests were different between two groups (p=0.01 and 0.02,) respectively.in our review study 13 studies met the eligibility criteria Out of 224 results of searching Most of the reports did not find a significant association between cognitive outcomes in patients with MS and ApoE genotype. In a accurate investigation ApoE4+ patients had more rate of impairment in SRT (OR:1.901; 95%CI: 1.237 to 2.920; p-value:0.003) but Contrary to the expectations patients in ApoE4- group were more likely to have impairment in Judgment of Line Orientation (JLO) (OR: 0.405; 95% CI: 0.173 to 0.949, p-value:0.038. and there wasn't significant difference in BVMT-R, Controlled Oral Word Association(COWAT), California Verbal Learning Test(CVLTII), Delis Kaplan Executive Function System DKEFS, PASAT and Symbol Digit Modalities Test (SDMT) (p-value: 0.003) as like as our previous study.

Conclusion : MS ApoE4 positive patients are more sensitive for CI; however, Based on the current evidence, there is a doubt about the clinical significance of this association. The study protocol is reviewed and approved by the Ethics Committee of TUOMS (approval number: IR.TBZMED. REC.1398.526)

Keywords : Apolipoprotein E4,Cognitive dysfunction,Multiple sclerosis

Count: 235
Abstract ID: 411
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Poster

Application of CRISPR/Cas9 System in the Treatment of Alzheimer's Disease and neurodegenerative diseases

Submission Author: Parsa Sameei

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Background and Aim : - Neurodegenerative diseases constitute a heterogeneous class of neurological disorders that affect the lives of millions of people worldwide. Alzheimer's is one of these diseases which has for many years, affected human life. Although many treatments have been proposed to control the side effects of this disease, there are still no effective treatments to treat or completely stop the progression of this disorder. Perhaps the lack of proper treatment for Alzheimer's can be related to various reasons, but the poor results related to recent clinical research have prompted doctors to look for new treatment approaches. In this regard, various researchers from all over the world have provided many new treatments, one of which is CRISPR/Cas9. Today, the CRISPR/Cas9 system is mostly used for genetic modifications in various species. In addition, by using the abilities available in the CRISPR/Cas9 system, researchers can either remove or modify DNA sequences, which in this way can establish a suitable and useful treatment.

Methods : - We conducted a non-systematic review of articles and study results from various databases, including PubMed, Medline, Web of Science, and Scopus, in recent years and also investigated new treatment methods in neurodegenerative diseases with a focus on Alzheimer's

disease. Then, in the following sections, the treatment methods were classified into three groups: anti-tau, anti-amyloid, and anti-APOE regimens. Finally, we discussed various applications of the CRISPR/Cas-9 system in Alzheimer's disease.

Results : - The results of our study were focused on the effects of the CRISPR/Cas-9 system on 7 genes mainly including the APP gene, the PLCγ2 gene, and the APOE gene. studies revealed that this gene-editing system can decrease both the risk and the progression of the disease. The mentioned effects were implemented via multiple molecular pathways including Decreased levels of Amyloid-β Production, enhanced microglial function, and Decreased γ-secretase activity.

Conclusion : Alzheimer's can be influenced by multiple genes in combination with lifestyle and environmental factors. the burden of this disease on the public health system worldwide has inspired many to search for new treatment strategies, one of which was CRISPR/CAS-9. From the data presented, it can be concluded that this system has shown great potential as a therapeutic approach for Alzheimer's disease, although more clinical studies are needed to confirm the usage of this system in human beings.

Keywords : Neurodegenerative Diseases; CRISPR/CAS9; Alzheimer's Disease; APOE; Amyloid Plaques

Count: 236
Abstract ID: 520
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Oral

RNA-based drugs for genetic neurological and neurodevelopmental disorders

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Background and Aim : Research on developing nucleic acid (RNA)-based therapeutics have paved the way for about forty years, however, COVID-19 pandemic has forced the world to trust on the first therapeutic usage of this type. Since a multitude of pathologies in neurological and psychiatric disorders have genetic roots, RNA-based therapeutics are ideally suited to address rare and ultra-rare genetic neurological diseases.

Methods : These technologies allow direct utilization of the gene sequence information associated with the disease in the design of the therapeutics. In addition, these technologies can target genes or gene products traditionally thought as undruggable, and in general exhibit a high degree of selectivity for their targets.

Results : Antisense drugs are a majority of these RNA-based drugs composed of a single strand RNA of 12 to 30 nucleotides that have been chemically modified to achieve an increase in their potency, tolerability, and stability. Interestingly over last months, two RNA-based drugs, Nusinersen and Tofersen have been approved by Food and Drug Administration to treat patients with Spinal Muscular Atrophy and Amyotrophic Lateral Sclerosis, respectively. These drugs are applied through intrathecal administration.

Conclusion : In this talk, I present briefly a history of RNA-based drugs and their recent applications in preclinical and clinical settings for rare, genetic based, neurological and neurodevelopmental disorders.

Keywords : Antisense drugs, gene therapy, Neurodegenerative disorders, Neurodevelopmental disorders

Count: 237
Abstract ID: 333
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

Transcranial photobiomodulation intensify learning and memory in hindlimb unloading in a mouse model of microgravity exposure

Submission Author: SAREH KAZMI

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Background and Aim : Prolonged microgravity exposure causes cognitive impairment. Evidence shows that oxidative stress and neuroinflammation are involved in the causation.

Methods : Here, we explore the effectiveness of transcranial near-infrared photobiomodulation (PBM) on cognitive deficits in a mouse model of simulated microgravity. 24 adult male C57BL/6 mice were assigned into three groups (8 in each); control, hindlimb unloading (HU), and HU + PBM groups. After surgery to fit the suspension fixing, the animals were housed either in HU cages or in their normal cage for 14 days. The mice in the HU + PBM group received PBM (810 nm laser, 10 Hz, 8 J/cm2) once per day for 14 days. Spatial learning and memory were assessed in the Lashley III maze and hippocampus tissue samples were collected to assess oxidative stress markers and protein expression of brain-derived neurotrophic factor (BDNF), nuclear factor erythroid 2-related factor 2 (Nrf2), Sirtuin 1 (Sirt1), and Nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB).

Results : Behavioral testing showed that the PBM-treated animals had a shorter latency time to find the target and fewer errors than the HU group. PBM decreased hippocampal lipid peroxidation while increasing antioxidant defense systems (glutathione peroxidase, superoxide dismutase, and

total antioxidant capacity) compared to HU mice. PBM increased protein expression of Sirt1, Nrf2, and BDNF while decreasing NF-κB compared to HU mice.

Conclusion : Our findings suggested that the protective effect of PBM against HU-induced cognitive impairment involved the activation of the Sirt1/Nrf2 signaling pathway, up-regulation of BDNF, and reduction of neuroinflammation and oxidative stress in the hippocampus.

Keywords : Microgravity model;Hindlimb unloading;Cognitive impairment; Transcranial photobiomodulation;Oxidative stress

Count: 238
Abstract ID: 610
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

An exploration of sensory-motor skills in professional eSports players

Submission Author: Faezeh Rezaei

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Background and Aim : Electronic sports or eSports is defined as competitive gaming. The scientific acceptance and exploration of eSports has increased in different fields of research over the years; Subjects such as eSports market and consumption studies, motivational factors as well as characteristics of eSports players and the essential skills needed for optimum performance. Professional eSports players train their cognitive and physical abilities to improve their chances of success against other players in several different national and international competitions. Sensory-motor skills play an important part in successful interaction between the virtual world of the game and players. The present work is a review of the sensory-motor skills observed in professional eSports players which have been explored individually in different studies.

Methods : High quality studies and experiments on sensory-motor skills in professional eSports players were found and gathered from different databases and peer-reviewed journals using several set of key words; the results and proposed discussions of which were summarized in the present review.

Results : Several studies have evaluated executive function, agility index, multiple object tracking and eye-hand coordination in occasional gamers and professional eSports players. Eye-hand coordination has particularly been under focus as it is of great importance across different genres of eSports. While it is suggested that different genres encourage different set of skills, eSports players who play action games in particular have shown superior sensory-motor skills.

Conclusion : While professional eSports players show an overall superiority in different sensory-motor skills such as object tracking, typing and coordination as well as reduced reaction time, it is suggested that such superiority is actually the result of learning rather than simply having better sensory-motor control.

Keywords : Electronic sports; eSports; Sensory-motor skills

Count: 239
Abstract ID: 470
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

The Performance of Machine Learning and Deep Learning for Diagnosis of Lumbar Spine Stenosis; A Systematic Review and Meta-Analysis

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Background and Aim : Lumbar spine stenosis (LSS) is a frequent spine disorder and is a severe debilitating condition that is associated with many burdens to patients and society. Patients with LSS face several challenges regarding diagnosis, determining severity, prognosis, and response to treatment. This study aimed to investigate the performance of machine learning and deep learning algorithms for patients with LSS.

Methods : This is a systematic review prepared according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The electronic databases of PubMed, Scopus, and Web of Science were comprehensively reviewed from conception to June 6, 2023.

Results : A total of 24 articles were included in systematic review and 4 studies included in meta-analysis as they provided sufficient quantitative data. 75% of studies used MRI images as the modality for machine learning and 25% used other modalities. The highest accuracy was 94.7%, while the lowest was 72.7%. Similarly, the highest sensitivity was 92.7% and the lowest was 65.2%. Based on the meta-analysis of four studies, the use of AI models for diagnosing lumbar canal stenosis showed a sensitivity of 0.86 (95% CI 0.76–0.93) and a specificity of 0.84 (95% CI 0.68–0.92). The positive likelihood ratio (LR+) was 5.29 (95% CI 2.77–10.11), while the negative likelihood ratio (LR-) was 0.16 (95% CI 0.10–0.27). The diagnostic score was found to be 3.48 (95% CI 2.92–4.04) and the diagnostic odds ratio was 32.55 (95% CI 18.75–57.05).

Conclusion : Deep learning models and machine learning models can have considerable effect on the diagnosis and grading of lumbar canal stenosis and recent studies reported models with acceptable performance.

Keywords : Lumbar Canal Stenosis; Machine Learning; Deep Learning; Grading

Count: 240
Abstract ID: 80
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

A Deep Learning Framework for Precise Chronic Subdural Hematomas Segmentation in Head CT scans

Submission Author: Amirmohammad Bahri

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Background and Aim : Chronic subdural hematomas (cSDHs) represent an increasingly prevalent neurological condition often necessitating surgical intervention to alleviate brain compression. The management of cSDHs relies heavily on computed tomography (CT) imaging, with serial scans frequently acquired to guide clinical decisions. The volume of the hematoma is a crucial parameter for effective therapy planning and for the evaluation of emerging management techniques. However, the current practice of objectively assessing hematoma relies on radiological measurements, such as maximal subdural hematoma thickness and the degree of midline shift, which provide only a limited assessment of the hematoma's true burden. Furthermore, Isodense hematoma poses a diagnostic challenge in cases of cSDH. This condition may not be well-recognized by emergency medicine specialists, general practitioners, and neurologists, potentially leading to oversight. The application of artificial intelligence can be instrumental in improving the accuracy of diagnoses in such instances. Our primary goal was to develop an automated program capable of accurately computing hematoma volumes from CT scans, encompassing preoperative images.

Methods : Following the approval of the institutional review board, we identified patients undergoing surgical management of cSDHs at Rasool Akram Hospital and collected their preoperative head CT scans for comprehensive analysis. A dataset consisting of 40,000 images (comprising 260 CT scans) was meticulously segmented manually. This dataset served as the foundation for training a convolutional neural network (CNN) to perform automatic cSDH segmentation. Ground truth data were established through initial segmentation conducted by three medical students with two-year experience in field of neurosurgery. Subsequently, the segmentations underwent rigorous review and revision by two attending neurosurgeons. For this purpose, we utilized a CNN model called CT-LungNet, which is, in fact, a customized adaptation of the U-Net architecture.

Results : The CNN model underwent training using preoperative scans dataset. We employed 10-fold cross-validation and subject-independent testing to assess the model's performance. Our proposed model achieved an impressive average DICE score of 0.901 ± 0.02 on the full dataset, significantly outperforming state-of-the-art models. Additionally, we conducted a comparative analysis of our model's performance against several benchmark architectures, including Resnet 18, VGG16, VGG19, DenseNet, and the unmodified U-Net model.

Conclusion : Subdural hematomas are inherently heterogeneous and complex lesions, often presenting a formidable challenge for segmentation tasks due to the presence of mixed densities, multiple compartments, and regions of isodensity with the surrounding brain tissue. Through rigorous training and validation, we successfully trained a convolutional neural network using a dataset encompassing postoperative head CT scans containing cSDHs. This innovative tool has the potential to greatly facilitate automated, precise measurements, thus enhancing the evaluation of treatment efficacy and ultimately improving patient outcomes in the management of cSDHs.

Keywords : Deep learning; SDH; Segmentation; Subdural hematoma

Count: 241
Abstract ID: 153
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

Comparison of novel surgery technologies for Glioblastoma removal: A Narrative Review

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Background and Objective: Glioblastoma (GBM) is widely recognized as the most prevalent and fatal brain tumor in adults. While there have been a few reports indicating that pediatric GBM prognosis is higher than in adults, the severity and aggressiveness of these tumors have stimulated extensive research for treatment, particularly focused on surgical techniques for removing GBMs and preventing further involvement of brain tissue. In this article, we have conducted a comprehensive review and comparison of the most cutting-edge surgical technologies for Glioblastoma removal. Methodology: A thorough search of various scientific databases such as PubMed, Scopus, and Web of Science was conducted to identify relevant studies published from 2010 to 2023. Studies that investigated and presented the most advanced surgery technologies for Glioblastoma removal, along with their respective advantages and disadvantages, were included. The main factors considered in our evaluation were post-operative complications, specifically infection risk and potential damage to brain vessels and anatomical structures, the ability to distinguish between healthy and malignant tissue, accessibility to different parts of the brain, the availability of equipment and associated expenses, and the year of introduction. Results and Discussion: Four of the newest technologies were selected for review, including Fluorescence Guided Surgery (FGS), Angiography with Indocyanine Green (ICG), Neuronavigation (NG), and Laser Interstitial Thermal Therapy (LITT). Based on the aforementioned factors, LITT was deemed the most noninvasive procedure with minimal post-operative complications. However, it should be noted that there is currently no systematic analysis or meta-analysis study that quantifies the differences between these procedures. LITT and FGS appear to be less readily available compared to NG in healthcare facilities, and they also come with higher operating costs. There have been reports of allergic reactions following the administration of ICG, and it is important to emphasize that this method requires more evidence-based research to establish its efficacy for vascular interventions, despite its noninvasive nature and associated advantages.

Keywords : Keywords: Glioblastoma; Fluorescence guided surgery; Angiography with indocyanine green; Neuronavigation; Laser interstitial thermal therapy

Count: 242
Abstract ID: 112
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

A Low-Cost, Open-Source Automated System for the Assessment of Rat Cognitive Behavior

Submission Author: Behnaz Namdarzadeh

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Background and Aim : The study of cognitive functions in animal models, particularly rats, plays an essential role in advancing our understanding of brain mechanisms and potential interventions. Yet, the challenge faced by many researchers and institutions is the prohibitive cost and the task-specific limitations of commercial behavioral assessment systems. Addressing these challenges, we sought to develop and validate a flexible, economical system suitable for a broad range of cognitive tasks.

Methods : The newly developed automated system is driven by a user-friendly, open-source software platform. This setup prioritizes adaptability, allowing potential modifications to accommodate diverse cognitive tasks. We detail the design criteria, materials used, and software architecture, ensuring its replicability across various research settings. To validate its efficacy, we employed this system in a specific cognitive task tailored to evaluate rat cognitive behavior.

Results : Preliminary findings revealed that our system reliably assessed the designated cognitive task, delivering consistent and reproducible results. The data generated was comparable to those obtained from more established, high-cost systems, showcasing the system's robustness and precision. Further, the open-source nature of the software allowed for streamlined data extraction, analysis, and interpretation, thus simplifying the research workflow.

Conclusion : Our low-cost, open-source automated system provides a promising alternative for cognitive behavioral assessments in rats. While the initial validation focused on one specific task,

the system's inherent flexibility underscores its potential applicability across a multitude of cognitive tasks. By bridging the gap between cost and functionality, this system is poised to democratize cognitive assessments, making sophisticated setups more accessible to a broader range of researchers and institutions. Future endeavors could expand the system's repertoire, adapting it to a more extensive array of cognitive tasks and potentially even other animal models.

Keywords : rat behavior; cognitive assessment; automation; open-source software; low-cost setup

Count: 243
Abstract ID: 615
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

A Deep Learning Framework for Automated Brain Tumor Segmentation in multimodal MRI images: Fusion of Vision Transformers and Convolutional Neural Networks

Submission Author: Benyamin Gheiji

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Background and Aim : Brain tumor segmentation is a crucial step in accurate diagnosis and treatment planning for patients with brain tumors, but the challenging complexity of brain tumors and the heterogeneity of their presentation pose a demanding task for segmentation in medical imaging. In recent years, deep learning techniques have demonstrated remarkable success in medical image analysis. However convolutional neural networks (CNNs) have been widely used for this task, their ability to capture long-range dependencies is limited. Vision transformers (ViTs), a novel class of deep learning architectures, have emerged as a powerful alternative,

demonstrating exceptional capabilities in capturing global feature relationships and leveraging contextual information.

Methods : This study proposes a novel hybrid deep learning architecture that combines the strengths of CNNs and ViTs for brain tumor segmentation. The proposed architecture consists of an encoder-decoder structure, with transformer blocks employed in the encoder and pretrained VGG16 CNN blocks utilized in the decoder. The encoder extracts global features using ViT blocks, while the decoder reconstructs the tumor segmentation mask using CNN blocks. The BraTS 2020 dataset, comprising 3D T1, T1CE, T2, and FLAIR MRI images, was employed to train and evaluate the proposed model.

Results : The proposed hybrid architecture achieved a Dice score of 89% on the whole tumor, demonstrating its superior performance compared to traditional CNN-based approaches.

Conclusion : The proposed hybrid deep learning architecture, combining the strengths of CNNs and ViTs, exhibited promising results for brain tumor segmentation. The integration of ViT blocks enhanced the model's ability to capture long-range relationships, leading to improved segmentation accuracy. With further validation and clinical adoption, this approach holds the potential to significantly impact neuroimaging analysis and contribute to improved diagnostic and treatment strategies for patients with brain tumors.

Keywords : Brain Tumor Segmentation; deep learning; Multimodal MRI; Vision Transformer; Convolutional Neural Network; BraTS2020

Count: 244
Abstract ID: 440
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

A machine learning approach for automatic identification of the best cell for patch clamp in whole cell recording images

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Background and Aim : Whole-cell patch clamp recording is a powerful technique for studying the electrical properties of individual cells, but the identification of the optimal target cell for recording remains a time-consuming and manual process. Typically, cells are selected for their accessibility and ability to form a tight seal on a patch clamp pipette. In this paper, we proposed a machine learning approach for the automatic identification of the most suitable cell for patch clamp experiments in whole-cell recording images.

Methods : Our method leverages the Histogram of Oriented Gradients (HOG) to extract meaningful features from cropped patches of microscopy images of cell populations. We selected five machine learning models, including Linear Support Vector Machine (SVM), Radial Basis Function Support Vector Machine (RBF SVM), Naïve Bayes, and Neural Network for training. A dataset consisting of 40 samples of labeled patches with the size of 100x100 from whole-cell

recording images was collected and divided into 80 percent for training and the remaining 20 percent for testing. Augmentation techniques were employed to handle the imbalance between target cell and the background patches. At the inference stage, the moving window was utilized to search for the best ROI containing target cell.

Results : The results demonstrate the effectiveness of our approach in accurately predicting the most suitable cells. We get the best results using RBF SVM with the accuracy, Sensitivity, Specificity, Precision, Recall, and F-score of 0.88, 0.8, 1, 0.8, 1 and 0.88, respectively. Furthermore, Naïve Bayes classifier has 100 percent Sensitivity and Precision which is better than other presented classifiers.

Conclusion : This work marks a substantial step forward in automating the patch clamp process, offering a robust and objective solution for selecting the most promising target cells, ultimately contributing to the advancement of cellular neuroscience and electrophysiology.

Keywords : cell recording; patch clamp; microscopy image; hog, machine learning

Count: 245
Abstract ID: 224
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

A protocol for reconditioning microelectrodes for reuse in electrophysiological recording

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Background and Aim : Up to now, a large variety of neural microelectrodes are developed. Although there are a lot of published works in this area, the majority of them are about the fabrication methods and rarely discuss the reconditioning procedure or how to re-use the electrodes that their performance is decreased because of material failure. In this paper, firstly, it is answered that why the performance of neural microelectrodes decreases. Secondly, a general low-cost protocol for reconditioning and re-using electrodes are proposed that can be utilized for the most types of electrodes with material failure. Lastly, the proposed reconditioning protocol is applied experimentally to single-site tungsten microelectrodes to demonstrate the effectiveness of the protocol. Neural signal recording Results clearly indicate that a large number of electrodes can be reconditioned well.

Methods : A single-site neural microelectrode was studied to demonstrate the effectiveness of our proposed protocol. The impedance of tungsten electrodes drops after several uses without any physical failure. Normally, re-annealing these electrodes for 2 hours is sufficient for reconditioning. If the impedance still remains low, then the second method, which is re-coating, is applied for reconditioning the electrodes. The electrode is rinsed with distilled water followed by ethanol and then dipped in the coating solution. Next, the electrode is pulled out slowly and placed in a holder vertically so that its tip points down. Then, a hot air flow, possibly generated by a hot gun, is used to smooth the surface of the coating. Finally, electrodes are located in an oven for 2

hours to be annealed. If there is a physical fracture in the electrode, such as a bent tungsten tip, it must be treated especially before the re-annealing or re-coating operation. For folded tips, chemical etching and trimming are used for small and large folded tips. Then, the coating and re-annealing process described above are done.

Results : After measuring the impedance of all the tested electrodes, 26 sample of the electrodes have their impedance decreased compared to before applying our proposed protocol, and the impedances have been improved with a noticeable result.

Conclusion : In this article, by proposing a protocol to restore the damaged electrodes, it is possible to prevent the wastage of resources in electrophysiology laboratories and use the electrodes again with acceptable accuracy. In this protocol, using simple and low-cost methods, this issue can be achieved and costs can be saved.

Keywords : Neural microelectrode, Reconditioning, Impedance, Annealing, Coating.

Count: 246
Abstract ID: 185
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

Safety Assessment of Drug Delivery across the Blood-Brain Barrier using Rapid Short-Pulse Sequences in vivo with Variable Intensity Focused Ultrasound

Submission Author: Fatemeh Nasrollahi Boroujeni

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Background and Aim : Focused ultrasound and nanobubbles can alter the blood-brain barrier (BBB) permeability, allowing drugs to enter the brain. However, when using long ultrasound pulses (500 ms), the BBB remains open for long time, which allows unwanted bloodborne proteins, such as albumin and immunoglobulins, to enter the brain. Recently, we have examined a Rapid Short-Pulse (RaSP) ultrasound sequence that alters the BBB permeability more uniformly throughout the brain and for less than one minute. Here, we explored whether the lower intensities of focused ultrasound represent a safer profile in BBB disruption. Therefore, we evaluated whether the lower intensity of focused ultrasound causes bleeding in the brain and whether this method has the necessary safety for drug delivery or not.

Methods : BALB/c mice were anesthetized and treated using transcranial High-Intensity-Focused Ultrasound (HIFU) and Low-Intensity-Focused Ultrasound (LIFU) under approved IACUC protocol to investigate whether lesions form in the brain. A 3 MHz central frequency was used and explored forming any lesion in the thalamus of six mice. The bregma and medial suture lines were used as reference for stereotaxic guidance of the tFUS (transcranial Focused Ultrasound) beams. We applied ultrasound pulses (according 3 MHz for central frequency 3, 9 and 15 W/cm2 as the intensity at 100 Hz pulse repetition frequency, 500 milli seconds) onto the mice. Nano-bubbles

was administered before application of ultrasound pulses. The mice were sacrificed after 6 hours of the ultrasound treatment to assess the amount of hemorrhage in the brain. Ultrasound focusing was used to examine the generation of lesions on the left side of the animal brain, while the no FUS treatment was used on the right side of the animal.

Results : In intensities 3 and 9 W/cm2 with both 30 seconds and 60 seconds pulses, no damage was determined in the examined animals in, the autopsy and brain examination also confirmed the absence of bleeding in the right and left lobes of the brain. At intensity of 15 W/cm2, a lesion was created in the brain during both 30 seconds and 60 seconds pulses. The autopsy confirmed hemorrhage and damage in the cerebral cortex, while intensity of 15 W/cm2 in the form of a single pulse has no collateral damage. In this work, we demonstrate in vivo the ability, feasibility, and efficacy of focused ultrasound at different intensities combined with a single-element FUS transducer, demonstrating the BBB opening and hemorrhaging in both sides of the mouse brain.

Conclusion : By combining focused ultrasound application with nano-bubble system, we assume to induce the permeability of BBB and so, allowing drugs to enter the targeted part of brain. This occurs when nano-bubbles exert mechanical stresses on the cell membrane by oscillating. In this study we optimized in vivo sonoporation through characterization of the effects of variant intensities on blood permeabilization rate. So far, the short ultrasound pulses in defined intensities could be employed regarding some preclinical and clinical cases.

Keywords : Blood-Brain Barrier; Focused Ultrasound; Nanobubbles

Count: 247
Abstract ID: 265
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

Advances in artificial intelligence, robotics, augmented and virtual reality in neurosurgery

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Neurosurgical practitioners undergo extensive and prolonged training to acquire diverse technical proficiencies, while neurosurgical procedures necessitate a substantial amount of pre-, post-, and intraoperative clinical data acquisition, making decisions, attention, and convalescence. The past decade witnessed an appreciable escalation in the significance of artificial intelligence (AI) in neurosurgery. AI holds significant potential in neurosurgery as it supplements the abilities of neurosurgeons to offer optimal interventional and non-interventional care to patients by improving prognostic and diagnostic outcomes in clinical therapy and assisting neurosurgeons in making decisions while surgical interventions to enhance patient outcomes. Other technologies including augmented reality, robotics, and virtual reality can assist and promote neurosurgical methods as well. Moreover, they play a significant role in generating, processing, as well as storing experimental and clinical data. Also, the usage of these technologies in neurosurgery is able to curtail the number of costs linked with surgical care and extend high-quality health care to a wider populace. This narrative review aims to integrate the results of articles that elucidate the role of the aforementioned technologies in neurosurgery.

Keywords : artificial intelligence; augmented reality; neurosurgery; robotics; virtual reality

Count: 248
Abstract ID: 405
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Symmetry Differences of Structural Connectivity in Multiple Sclerosis and Healthy State

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Background and Aim : Focal and diffuse cerebral damages occur in Multiple Sclerosis (MS) that promotes profound shifts in local and global structural connectivity parameters, mainly derived from diffusion tensor imaging. Most of the reconstruction analyses have applied conventional tracking algorithms largely based on the controversial streamline count.

Methods : For a more credible explanation of the diffusion MRI signal, we used convex optimization modeling for the microstructure-informed tractography2 (COMMIT2) framework. All multi-shell diffusion data from 40 healthy controls (HCs) and 40 relapsing-remitting MS (RRMS) patients were transformed into COMMIT2-weighted matrices based on the Schefer-200 parcels atlas (7 networks) and 14 bilateral subcortical regions.

Results : The success of the classification process between MS and healthy state was efficiently predicted by the left DMN-related structures and visual network- associated pathways. Additionally, the lesion volume and age of onset were remarkably correlated with the components of the left DMN. Using complementary approaches Such as global metrics revealed differences in WM microstructural i integrity between MS and HCs efficiency, strength).

Conclusion : Our findings demonstrated that the cutting- edge diffusion MRl biomarkers could hold the potential for interpreting brain abnormalities in a more distinctive way.

Keywords : DTI, Neuroimaging, Multiple Sclerosis, COMMIT2, Structural Conncetivity, Graph Theory

Count: 249
Abstract ID: 356
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Mesenchymal stem cells moderate inflammatory response of brain specific endothelial cells in face to toxic α-synuclein

Submission Author: Dina Morshedi

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Background and Aim : Parkinson's disease (PD) impacts the nervous system and is characterized by a variety of motor and non-motor symptoms. A notable aspect of PD is the presence of expanded amyloid aggregates of α-synuclein (αSN-AGs), particularly in the substantia nigra. It should be noted that the toxicity of αSN-AGs is not limited to neuron cells; rather, it has the potential to be detrimental to blood brain barrier (BBB) cells. The current medical interventions for PD can merely offer temporary relief to patients and have not achieved success in halting the progression of the illness. Mesenchymal stem cells (MSCs) possess advantageous properties for the treatment of PD, such as the ability to replace or repair lost or damaged cells within the brain.

Methods : UC-MSCs were obtained from the Umbilical cord tissue and subsequently fragmented into small pieces (1 - 2 cm) following thorough washing with sterile PBS and fragmented into smaller pieces (1-2 mm) to culturing. Following the isolation and expansion of the stem cells, their purity was evaluated using flow cytometry, based on the presence of specific surface antigens (CD44, CD105, and CD90). Subsequently, the impact of the UC-MSC cells on the production of inflammatory cytokine (TNF-α) and anti-inflammatory cytokines (IL8, IL10) was investigated by treating brain-specific endothelial cells (hCMEC/D3 cells) with αSN-AGs.

Results : We found that αSN-AGs enhanced production of TNF-α in hCMEC/D3 cells. Nevertheless, the presence of hUC-MSCs in co-culture with hCMEC/D3 cells significantly obstructed the elevation of this pro-inflammatory factor. Furthermore, our study determined that

treating with toxic lipopolysaccharide also induced secretion of different inflammatory factors from hCMEC/D3.

Conclusion : The BBB is believed to play a significant role in neurodegenerative diseases such as PD. The initiation of certain inflammatory responses in the BBB has the potential to trigger a perilous cascade that ultimately leads to irreversible damage in brain cells. The utilization of MSC, which secrete various known and unknown factors, can effectively regulate undesirable activity in BBB cells and is therefore regarded as a novel therapeutic strategy.

Keywords : Parkinson's disease, Alpha-synuclein, Mesenchymal stem cells, Inflammatory factors

Count: 250
Abstract ID: 209
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Berberine Chloride impacts on alfa synuclein fibrillation process

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Background and Aim : Berberine Chloride (Berb) is an isoquinoline alkaloid found in herbs such as Coptis and Berberis. The role of berberine in the treatment of Parkinson's disease (PD) was previously confirmed by improving intestinal flora, suppressing inflammatory factors, preventing dopaminergic nerve damage and inhibiting apoptosis in the hippocampus or induces autophagy. However, the investigation of its impact on the aggregation of αSN had not yet been conducted. There is a strong belief that αSN aggregation is closely connected to both the genetic and neuropathological aspects of PD, and therefore, it can serve as a primary focus for the treatment of PD.

Methods : In the present study, the effect of Berb on the fibrillation process of monomeric αSN was investigated Based on the results of the ThT fluorimetry test.

Results : I was determined that Berb induces the fibrillation process of ?SN.

Conclusion : It seems this compound elicits the generation of substantial conformers that have the potential to evade the creation of harmful intermediate substances, such as oligomeric conformers. Conversely, the inquiry into how Berb induces the formation of fibrils conformers remains a crucial matter that needs further investigation.

Keywords : Parkinson disease; alfa-synuclein; fibrillation; berberine chloride

Count: 251
Abstract ID: 290
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Effects of Exosome Therapy in Animal Model of Spinal Cord Injury. A Systematic Review and Meta-Analysis

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Background and Aim : -A spinal cord injury involves damage to the spinal cord that causes temporary or permanent changes in the movement, senses. Exosomes have opened a new way to repair nervous system diseases. We used systematic review, meta-analysis to investigate the effect of exosome on locomotor function of animal models of spinal cord injury
Methods : -In this study, a search was made in PubMed, Scopus and Web of Science databases January 1, 2000 to January 1, 2023 with ke word (((((((exoxome) OR (extracellular vesicle)) AND (spinal cord injury)) OR (spinal cord lesion)) OR (spinal cord trauma)) OR (spinal injury)) OR (spinal lesion)) OR (spinal trauma).Articles that used exosome for traumatic animal models of spinal cord were selected. The mean and standard error of behavioural Basso–Beattie–Bresnahan (BBB) TEST data were subjected to meta-analysis. Two authors independently screened the articles based on inclusion and exclusion criteria. The mean and standard error of apomorphine or amphetamine-induced rotation data were subjected to meta-analysis. Two authors independently screened the articles based on inclusion and exclusion criteria. Get Data Graph Digitizer was used to quantify the mean value and standard deviation (SD) or standard error (SE) from figures if only graphs were available. While only the standard error was reported, the standard deviation was converted by standard error with the following formula: $SD = \sqrt{N} \times SE$, where N represents the size of the group. All statistical analyses were conducted using CMA software.
Results : -Significant improvement was observed in the overall pooled standardized mean difference (SMD) between animals treated with exosomes compare to control (behavioural Basso–Beattie–Bresnahan (BBB) TEST 1.163 (95% confidence interval [CI]; $P < 0.001$)
Conclusion : Exosome therapy Improves locomotor impairment in traumatic spinal cord injury model
Keywords : : Exosome; Spinal Cord Injury; Meta-analysis; Animals model.

Count: 252
Abstract ID: 178
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Pomegranate seed extract ameliorates scopolamine-induced amnesia in rats

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Background and Aim : Involvement of oxidative stress and dysregulation of cholinergic system have been reported in the pathophysiology of Alzheimer's disease. Punica granatum L. (pomegranate) has been reported to have anti-oxidant and neuroprotective effects. Present study aimed to investigate the effects of pomegranate seed hydro- ethanolic extract on cholinergic dysfunction and oxidative stress in a rat model of scopolamine-induced amnesia.

Methods : In this study, fifty rats were divided into five groups of ten. The control group in which the rats received saline instead of scopolamine and the solvent of the extract, ie drinking water during 3 weeks. The scopolamine group in which the rats received the solvent of the pomegranate seed extract during 3 weeks. The rats of this groups were injected by scopolamine (2 mg / kg) 30 min after the solvent of the extract at the third week. The treatment groups (Scopolanine + pomegranate seed hydro- alcoholic extract) in which the rats received 200, 400 or 800 mg /kg pomegranate seed hydro- alcoholic extract since 2 weeks before starting the behavioral experiments. The rats of these groups were injected by scopolamine (2 mg / kg) 30 min after receiving the extract (gavage) at the third week. At the third week, the behavioral tests including morris water maze and passive avoidance (PA) test were done for all groups. Finally, oxidative stress indicators and acetyl cholinesterase (AChE) activity in the brain tissue were measured.

Results : Scopolamine impaired memory and learning. All three doses of the extract shortened the traveling time and distance to reach the platform during 5 days learning in MWM (P<0.05-P<0.00). Both 400 and 800 mg/ kg of the extract increased the time and distance in the target area in the probe trial (P<0.001). The extract also increased the delay time to enter the dark (P<0.05-P<0.001) and the time spent in the light (P<0.05-P<0.001) while, decreased the time spent in the dark segment (P<0.05-P<0.001) in PA test. The extract also decreased malondialdehyde (P<0.05-P<0.001) and AChE(P<0.05-P<0.001) while, increased the thiol content(P<0.05-P<0.001) and superoxide dismutase (P<0.05-P<0.001) activity in the cortex and hippocampus.

Conclusion : The extract ameliorated learning and memory impairments induced by scopolamine in rat which it seems to be via improvement of cholinergic system function and suppression of oxidative stress.

Keywords : Cholinergic dysfunction, Acetyl cholinesterase, Punica granatum L, Learning and memory deficit, Oxidative stress

Count: 253
Abstract ID: 254
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The effects of different durations of heat stress exposure on heat shock protein 70, oxidative stress and endoplasmic reticulum stress markers in the cerebellum

Submission Author: Behzad Mansouri

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Background and Aim : The environment and human health are at great risk due to the escalating ambient heat levels, especially for vulnerable individuals. Heat stroke, a failure in thermoregulation caused by prolonged exposure to heat, can develop into heatstroke, which impacts the central nervous system, especially the cerebellum. High body temperatures have a profound impact on the cerebellum, and survivors of heatstroke frequently exhibit persistent neurological deficiencies. Heat stress-induced tissue injury is caused by heightened cellular reactive oxygen species (ROS) and weakened enzymatic antioxidant defenses. Various stimuli can disrupt the endoplasmic reticulum (ER), resulting in the accumulation of unfolded or misfolded proteins and ER stress. heat shock protens (HSPs) are involved in cell repair and preventing hyperthermia in the CNS. This study aims to assess the influence of different days of thermal stress on markers of oxidative stress, apoptosis, and endoplasmic reticulum stress in the cerebellum of mice

Methods : The study involved fifty-six healthy adult male C57BL/6 mice, which were randomly allocated into two groups: normothermic (control) and heat stress (HS). Animals in the HS group were placed in a temperature-controlled chamber maintained at 43 °C and 60±10% humidity, for 15 min/day for 7, 14, 21, and 42 days. The core temperature of the mice was measured using a rectal probe. The mice were anesthetized with Ketamine and Xylazine following the last heat exposure, and their cerebellum was isolated. The production of intracellular ROS in the cerebellum was evaluated using dichlorohydro-fluorescein diacetate (DCFDA) method. The Western blot method was used to measure the expression of various proteins, including protein kinase RNA-

like endoplasmic reticulum kinase (PERK), full-length activating transcription factor 6 (ATF-6), C/EBP homologous protein (CHOP), pro- and cleaved-caspase-3, and Hsp70.

Results : HS exposure resulted in a significant increase in core temperature and cerebellar ROS levels compared to the control animals. Moreover, the protein expression of Hsp70 significantly increased in the HS groups on the 7th and 14th days, but decreased on the 21st and 42nd days compared to the control group. Additionally, we observed a notable rise in protein expression of ER-stress markers, including active ATF-6/Full-length ATF-6, CHOP, p-PERK levels, and cleaved caspase 3 in the cerebellum of HS-exposed animals.

Conclusion : To summarize, chronic intermittent HS exposure resulted in increased production of ROS, as well as expression patterns of HSP70, PERK, CHOP, ATF6, and caspase-3 in the cerebellum. According to the results, HSP70 protects the cerebellum from hyperthermia-induced changes for two weeks, but a potential loss of HSP70-related protection after this period may contribute to increased oxidative stress, up-regulation of ER stress markers, and higher levels of cleaved caspase-3 in the cerebellum of mice.

Keywords : Heat stress · Cerebellum · Oxidative stress · Apoptosis · Endoplasmic reticulum stress · Heat shock protein (HSP)7

Count: 254
Abstract ID: 293
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Evaluating the levels of BDNF expression in male rat offspring whose parents were completely sleep deprived during pregnancy

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Background and Aim : Recent study findings suggest that complete sleep deprivation during pregnancy could potentially pose a risk for the development of neurodegenerative disorders in offspring Wistar rats. Resveratrol, a compound that can be derived from various sources such as vegetables, fruits, cereals, roots, flowers, seeds, tea, and wine, has been the subject of limited research regarding its effects on the brain. Nonetheless, several animal studies have indicated that resveratrol exhibits neuroprotective and anti-inflammatory properties. Emerging evidence further supports the potential utility of resveratrol in the treatment of neurodegenerative diseases.

Methods : Maternal sleep deprivation was experimentally induced at embryonic stages E7, E11, and E17. In order to explore the potential neuroprotective effect of Resveratrol, a western blot test was conducted on the offspring of male rats, specifically targeting the hippocampus region of their brains. The objective of this assessment was to evaluate the level of expression of Brain-Derived Neurotrophic Factor (BDNF).

Results : The Western blot analysis exhibited that the group subjected to total sleep deprivation experienced a decrease in the expression of BDNF in the hippocampus of male Wistar rats, as compared to the control group with normal sleep patterns. Subsequently, the administration of 50 mg/kg of Resveratrol to the total sleep deprivation group resulted in a significant increase in BDNF expression levels. Similarly, the application of 25 mg/kg of Resveratrol to the total sleep deprivation group led to a substantial enhancement in BDNF expression levels, albeit not reaching statistical significance when compared to the total sleep deprivation group. Lastly, no notable disparity in BDNF expression was observed between the sham group and the control group with normal sleep patterns.

Conclusion : : The findings indicate that resveratrol exhibits a neuroprotective impact within a rat pregnancy model of total sleep deprivation, thereby reducing the likelihood of neurodegenerative ailments in the offspring. These observations hold potential for the development of innovative therapeutic interventions targeting prenatal neurodegenerative disorders.

Keywords : Maternal Sleep Deprivation, Brain-Derived Neurotrophic Factor, Offspring, Resveratrol.

Count: 255
Abstract ID: 212
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Heart rate variability in Parkinson's disease patients with REM sleep behavior disorder

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Background and Aim : In addition to motor symptoms, many Parkinson's disease (PD) patients experience non-motor symptoms, including rapid eye movement (REM) sleep behavior disorder (RBD), which is characterized by the loss of normal muscle atonia during REM sleep. RBD has been associated with various autonomic dysfunctions and has been proposed as a potential early marker for the development of PD. In this study, we investigated differences in heart rate variability (HRV) to determine whether patients with RBD experience more disturbed HRV when compared to non-RBD patients, indicating greater autonomic deficits.

Methods : We analyzed records of 63 participants from the Parkinson's Progression Markers Initiative (PPMI) dataset [23 healthy controls (HC), 20 REM, and 20 non-REM PD patients] matched for age and sex. Total scores calculated from the RBDSQ assessment were used to categorize patients into RBD and non-RBD groups. We utilized recordings obtained from the Verily Study Watch, a wearable device that provides continuous and non-invasive monitoring, over a one-year period around the time of the RBDSQ assessment. Verily Study Watch used the root mean square of successive differences between normal heartbeats (RMSSD) to address HRV. The output of the device was presented as hourly mean RMSSD values. Analysis was conducted using the calculated average of hourly mean RMSSD values recorded over a year for each participant. We categorized recordings into in-bed and out-of-bed groups.

Results : No differences between PD and HC patients were found in HRV values (P>0.05). Patients assigned as RBD were presented with a lower out-of-bed HRV compared to non-RBD patients (P=0.011). No differences were found in in-bed recordings between groups (P>0.05). RBD patients also scored higher in SCOPA-AUT, showing a higher autonomic disturbance in these patients (P=0.024). Levodopa equivalent daily dose (LEDD) values were not significantly

different across RBD and non-RBD groups (P>0.05). In the logistic regression model (P=0.026), out-of-bed HRV exhibited a significant discriminative power between RBD and non-RBD groups [Odds ratio (OR)=0.622, Confidence interval (CI)=0.390-0.993, P=0.047].

Conclusion : Our findings suggest that PD patients with RBD exhibit altered HRV patterns during out-of-bed periods, indicating greater autonomic dysregulation. These results highlight the potential utility of HRV analysis using wearable sensors as a non-invasive tool for assessing autonomic dysfunction in PD patients with RBD. Further research is needed to elucidate the underlying mechanisms linking RBD, autonomic disturbances, and HRV patterns in Parkinson's disease. These findings may contribute to improved diagnosis, monitoring, and management strategies for PD patients with RBD.

Keywords : Sleep; Parkinson’s disease; autonomic nervous system; heart rate variability; wearables;

Count: 256
Abstract ID: 258
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Beneficial effects of spirulina microalgae on superoxide dismutase activity and cognitive disorders induced by STZ in male Wistar rats

Submission Author: Fatemeh Zeinihamzekolaei

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Background and Aim : Alzheimer's disease (AD) is a complex neurodegenerative condition with multiple contributing factors, leading to the decline in memory, behavioral changes, and impaired daily functioning. Research has demonstrated that intracerebroventricular streptozotocin (ICV STZ) induces cognitive impairment in rats by promoting the accumulation of free radicals within the brain. Spirulina contains chlorophyll, a green pigment known for its antioxidative capabilities and potential detoxification benefits. In this current study, we conducted an investigation into the impact of Spirulina on cognitive impairment induced by ICV administration of STZ, along with an evaluation of its effect on superoxide dismutase (SOD) activity in rats.

Methods : In this study, 30 adult male rats were randomly divided into 3 groups. Control group, STZ group (3 mg/kg, ICV), STZ group treated with spirulina (50 mg/kg, 21 days by gavage). Learning behavior and memory were assessed using novel object recognition. On the 21st day of the experiment, the rats were euthanized for the purpose of assessing SOD activity within the hippocampal region.

Results : STZ significantly (**P < 0.01 and ***P < 0.001) caused learning and memory impairment in rat. It also significantly (***P < 0.001) decreased the activity of SOD in hippocampal in STZ group. Spirulina treatment significantly (+++P < 0.001) increases the time and frequency of exploration between the novel object and the old object compared to the STZ group. Therefore, it indicates that spirulina improved recognition memory consolidation. Also, the activity of SOD antioxidant enzyme in rats treated with spirulina increased significantly (+++P < 0.001) compared to STZ group.

Conclusion : Spirulina demonstrated the potential to mitigate cognitive impairments and restore superoxide dismutase (SOD) activity changes induced by streptozotocin (STZ) in the hippocampus. These findings suggest that spirulina could be a promising candidate for therapeutic interventions in Alzheimer's disease.

Keywords : Microalgae, Spirulina, STZ, Antioxidant

Count: 257
Abstract ID: 447
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigation of the quercetin effects on conditioned fear extinction in PTSD rats

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Background and Aim : Post Traumatic Disorders (PTSD) is one of the diseases of the nervous system, which is caused by exposure to very severe harmful agents. In these patients, memories of traumatic events are reconsolidated and the process of extinction of traumatic memory in a person is impaired. The destruction of brain neurons (especially in the hippocampus) due to oxidative stress is the main cause of PTSD disease. Quercetin has been identified as a potent oxidative stress reducer. The objective of the present study was evaluation of the quercetin effects on conditioned fear extinction in PTSD affected male rats, especially in matter of its effects on oxidative stress in the hippocampus

Methods : male rats divided in six groups. The control group that were affected to PTSD and solvent of the quercetin was injected to them. The 2nd, 3rd and 4th groups that were affected to PTSD and received the quercetin with the dosage of 10, 25 and 50 mg/kg body weight, respectively. The 2 last groups were fear conditioned and the quercetin with the dose of 50kg/mg and its solvent were administered to them, respectively. Induction of PTSD was done by the single prolonged stress (SPS) method. The quercetin was injected to the rats immediately after the induction of PTSD. During the 3 consecutive tests, in 3 days, the time of freezing of the rats, was investigated as an indicator of fear conditioned memory. Two hours after the 3rd fear conditioning test, Due to evaluation of anxiety like behaviors and also sensitized fear, elevated plus maze and open field tests were done. After the termination of behavioral tests, the animals were killed and in order to measurement of glutathione peroxidase (GPX), superoxide dismutase (SOD) and also malondialdehyde (MDA), their hippocampus was brought out

Results : Querctetin with the dose of 50 mg/kg, in comparison to control group, significantly reduced the freezing time of the rats in all of 3 consecutive fear conditioning tests and also significantly increased the times of crossing through Central Square in open field test. In elevated plus maze test, Quercetin with the dose of 10, 25 and 50mg/kg body weight, was incapable of induction of significant effects on anxiety markers in rats. In conclusion, behavioral tests were representative of effectiveness of the quercetin with the dose of 50mg/kg, on behavioral disorders of PTSD affected rats. But, the biochemical studies showed that this dose of quercetin has no significant effect on the levels of MDA, GPX and SOD in the hippocampus of affected animals.

Conclusion : 1- Quercetin causes the enhancement of extinction of fear memory, dose-dependently. 2- Quercetin with the dose of 50mg/kg decreases the sensitized fear in the PTSD affected rats. 3- Quercetin has no significant effect on anxiety. 4- Evaluation of oxidative stress indices, 10 days after induction of PTSD and quercetin injections, showed that the quercetin had no significant effect on these indices at this time.

Keywords : Oxidative Stress, Quercetin, Fear Extinction, post-traumatic stress disorder (PTSD)

Count: 258
Abstract ID: 426
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

MicroRNAs: A promising Biomarker for Alzheimer's Disease diagnosis

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Introduction: Alzheimer's disease (AD) is a complex multi-stage disease that currently afflicts over 50 million people worldwide. Alzheimer’s disease (AD) is a multifactorial, agerelated neurological disease characterized by complex pathophysiological dynamics taking place at multiple biological levels, including molecular, genetic, epigenetic. Changes in the way microRNA (miRNA) signals are transmitted have been linked to the genetic and epigenetic factors involved in all the neurobiological processes associated with Alzheimer's disease. MiRNAs are small, non-coding RNA molecules that negatively regulate gene expression at the post-transcriptional level. About 70% of the miRNAs that have been identified so far are present in the brain. This suggests that miRNAs could be useful in monitoring neurodegenerative processes, and certain miRNAs may be associated with specific neurodegenerative diseases. Methods: This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords microRNA, Alzheimer's Disease, Biomarkers, 77 articles related to inclusion criteria were extracted and then analyzed. Results: The results indicate that various studies that have examined the role of microRNAs (miRNAs) in Alzheimer's disease (AD). These studies have found that certain miRNAs, including miR-9, miR-125b, and miR-128, are elevated in the hippocampus of AD patients compared to normal controls. Other studies have suggested that miRNAs in serum and other bodily fluids may serve as non-invasive biomarkers for AD diagnosis and prognosis. Additionally, dysregulation of certain miRNAs, such as miR-29a/b-1, miR-29c, and miR- 339-5p, has been linked to increased production of Amyloid-β, a hallmark of AD. Overall, miRNAs are considered promising candidates for AD biomarkers and further research is needed to fully understand their role in the disease. Discussion: The analysis of miRNAs, which are small non-coding RNAs, has demonstrated the ability to diagnose Alzheimer's disease and has made significant progress over the last 20 years. As a result, miRNAs found in the bloodstream have been suggested as a highly effective biomarker for Alzheimer's disease and other neurodegenerative disorders.

Keywords : Alzheimer's Disease, MicroRNAs, Biomarkers

Count: 259
Abstract ID: 400
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Robust and Accurate Diagnosis of Multiple Sclerosis from MRI using Deep Neural Networks

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Background and Aim : Multiple sclerosis (MS) is a debilitating chronic autoimmune disease that affects the central nervous system (CNS). This complex ailment is marked by an autoimmune etiology, resulting in localized regions of demyelination, axonal loss, and gliosis within the brain and spinal cord. MS predominantly targets young adults and has a profound impact on their quality of life. The underlying pathogenesis of MS revolves around two key processes: inflammation and neurodegeneration. Inflammation is typically linked to relapses, while neurodegeneration tends to manifest in the progressive stages of the disease. The diagnosis of MS primarily relies on magnetic resonance imaging (MRI), with established guidelines such as the McDonald criteria providing valuable diagnostic insights. MRI plays a pivotal role in revealing the spatial distribution and temporal changes associated with the disease. In light of the growing capabilities of artificial intelligence (AI), this article is motivated by the exploration of AI-based exemplar models' potential in aiding the diagnosis and continual monitoring of MS.

Methods : Our dataset, encompassing 523 MS patients, each providing 1506 MRI images. This dataset is complemented by a control group consisting of 150 healthy individuals, contributing 1300 MRI images sourced from Rasool Akram Hospital. Our research delves into the application of sophisticated image processing techniques to enhance the accuracy and efficiency of MS diagnosis. Specifically, we employ the MobileNetV2 network in combination with exemplar-based learning, IMrMr feature selection, and LightGBM classification methods.

Results : The experiments conducted in this study showcase the remarkable accuracy of these advanced techniques in diagnosing MS. The research incorporates a robust 10-fold cross-validation methodology and subject-independent testing, encompassing various image sections, including Axial, Sagittal, and Hybrid views. The results are nothing short of impressive, with accuracy rates soaring to 99.76% for Axial images, 99.48% for Sagittal images, and 98.02% for Hybrid sections. The high diagnostic accuracy achieved in this study holds great promise for improving the clinical assessment and management of MS patients. These results imply that the utilization of AI-based exemplar models has the potential to revolutionize the diagnosis and monitoring of MS.

Conclusion : In conclusion, our research underscores the efficacy of utilizing cutting-edge image processing methods, particularly the MobileNetV2 network, and exemplar-based learning, in the context of diagnosing MS. These findings not only highlight the potential for further advancements in future research but also emphasize the significant promise these methods hold for clinical applications in the realm of MS diagnosis and monitoring. The integration of AI-based exemplar models into the diagnosis process may not only lead to more accurate and timely diagnoses but also enhance our understanding of the disease's progression, ultimately improving the quality of life for individuals affected by MS. As we continue to explore the intersection of AI and medical diagnostics, it is clear that the potential for innovation and advancement in the field of multiple sclerosis research is vast.

Keywords : Multiple sclerosis, Deep Learning, Diagnostics, MRI

Count: 260
Abstract ID: 421
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Soy extract improved spatial learning and memory and attenuated oxidative stress in a rat model of cognitive impairment induced by scopolamine

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Background and Aim : Beneficial effects of soy on the central nervous system has been reported. Soy has been reported to have antioxidant and neuroprotective properties. In the current study, the improving effects of soy extract on spatial learning and memory and its antioxidant effect in the brain was examined in a rat model of cognitive impairment induced by scopolamine.

Methods : The rats were ovariectomized then were divided into 6 groups: were divided into the following groups: (1) Control, (2) Scopolamine, (3-4) Scopolamine groups treated with 20 or 60 mg/ kg soy, (5-6) Scopolamine groups treated with 20 or 60 µg/ kg estradiol. The treatment with soy extract or estradiol was done during 6 6 weeks . The rats the control and scopolamine groups received vehicle instead of soy and estradiol. In the lats 6 days scopolamine (2 mg/ kg) was injected and 30 minute later Morris water maze (MWM) test was done . The rats were finally sacrificed, the brains were removed, and oxidative stress indicators including malondialdehyde (MDA) and thiol concentration and superoxide dismutase (SOD) and catalase (CAT) activity were measured.

Results : The traveling time and distance to reach the platform was increased in scopolamine group ($p < 0.001$). The rats of scopolamine group spent shorter time and travelled shorter distance in the target area in the probe trial of MWM test ($p < 0.001$). The higher dose of soy (60 mg/kg) and both doses of estradiol (20 and 60 ?g/kg) shortened the traveling time and distance to reach the platform and prolonged the time spent and distance traveled in the target area in the probe trial ($p < 0.05$ - $p < 0.001$). Cortical and hippocampal MDA concertation was increased but thiol content and SOD and CAT activities were decreased in the scopolamine group compared to the control group($p < 0.001$). Cortical and hippocampal MDA was decreased by soy extract and estradiol (p

< 0.001and p < 0.01 respectively). Cortical and hippocampal thiol, SOD and CAT in the animals were treated by soy extract and estradiol before scopolamine(p < 0.01 - p < 0.001).

Conclusion : It was shown that soy extract improved spatial learning and memory and attenuated oxidative stress in a rat model of cognitive impairment induced by scopolamine. The effects of soy was comparable to the effects of estradiol.

Keywords : Soy, Learning, Memory, Scopolamine, Oxidative stress.

Count: 261
Abstract ID: 611
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Truncated Whey Proteins as Bioactive Peptides Inhibit Alpha-Synuclein Fibrillization

Submission Author: Maryam Motamedi

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Background and Aim : In recent years, the role of bioactive peptides in preventing protein misfolding and aggregation has become a subject of great interest. Whey proteins, a byproduct of cheese production, are rich in bioactive peptides that can be released through the process of hydrolysis. Whey protein hydrolysates (WPHs) have shown promise in inhibiting Alpha-Synuclein (ASN) fibril formation, which is a hallmark event in Parkinson's disease (PD). In this study, we investigated the impact of WPHs produced by tryptic and peptic hydrolysis, on ASN fibrillization.
Methods : Whey protein isolate (WPI) hydrolyzed with trypsin (at pH 8.7), and pepsin (at pH 2.7) alone or in a combination procedure for 4 hours at 37 °C, and after being filtered through a 3 kDa membrane, the products were lyophilized. The effect of different WPH products at various concentrations on ASN fibrillation was monitored using Thioflavin-T (ThT) fluorescence assay as well as fluorescence microscopy imaging. Cell cytotoxicity on the SH-SY5Y neuroblastoma cell line was assessed by MTT assay.
Results : The incorporation of tryptic hydrolyzation of WPI alone or in combination with pepsin hydrolyzation showed not only a significant inhibition effect on ASN fibrillation but also, disaggregated the pre-formed fibrils of ASN in a dose-dependent manner. In addition, the cytotoxicity of ASN treated by trypsinized WPI was significantly decreased compared with non-treated ASN.
Conclusion : This study suggests that the derived peptides produced by hydrolyzation of WPI could be a promising natural solution in the battle against PD.
Keywords : Whey Protein isolate, Bioactive Peptide, Alpha-Synuclein

Count: 262
Abstract ID: 455
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Anti-inflammatory, anti-apoptotic, and neuroprotective potentials of anethole in Parkinson's disease-like motor and non-motor symptoms induced by rotenone in rats

Submission Author: Alireza Sarkaki

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Background and Aim : Parkinson's disease (PD) is a complex neurological disorder characterized by a combination of motor and non-motor symptoms (NMS). Antioxidant and anti-inflammatory compounds are considered a potential therapeutic strategy against PD. The present study examined the neuroprotective effects of anethole as a potent antioxidant and anti-inflammatory agent against motor and non-motor deficits induced by rotenone toxicity.

Methods : Eight-week-old male Wistar rats (200–220 g) were divided into the following groups: Group I: Control; rats received DMSO + sunflower oil (1 ml/kg, s.c.), once daily for 35 days. Group II: Rotenone (Rot); rats received rotenone (2 mg/kg, s.c.), once daily for 35 days. Group III: Rot +Ant62.5; rats received anethole (62.5 mg/kg, i.g.) and rotenone (2 mg/kg, s.c.), once daily

for 35 days. Group IV: Rot +Ant125; rats received anethole (125 mg/kg, i.g) and rotenone (2 mg/kg, s.c.), once daily for 35 days. Group V: Rot +Ant250; rats received anethole (250 mg/kg, i.g.) and rotenone (2 mg/kg, s.c.), once daily for 35 days. Group VI: Rot+L-DOPA: PD rats received mixture of L-DOPA/Carbidopa (100 mg/kg, 10 mg/kg, i.p. respectively) 1h prior to the rotenone administration (2 mg/kg, s.c), once daily for 35 days. After the treatment, behavioral tests were performed to evaluate motor function and depression-/anxiety-like behaviors. After the behavioral tests, rats were decapitated and brains were removed for histological analysis. Striatum samples were also isolated for neurochemical, and molecular analysis.

Results : Our data showed that rotenone-induced motor deficit, anxiety-and depression-like behaviors were significantly improved in rats treated with anethole. Furthermore, anethole treatment reduced inflammatory cytokines tumor necrosis factor α (TNFα) and Interleukin 6 (IL-6), and increased anti-inflammatory cytokine IL-4 in the striatum of rotenone-induced PD rats. Western blot analysis showed that treatment with anethole markedly suppressed caspase-3 activation induced by rotenone. Moreover, histological examination of striatum showed an increase in the number of surviving neurons after treatment with anethole. Anethole also significantly enhanced the striatal levels of dopamine in rotenone-induced PD rats. In addition, treatment with L-Dopa as a positive control group had effects similar to those of anethole on histological, neurochemical, and molecular parameters in rotenone-induced parkinsonian rats.

Conclusion : Our results suggested the neuroprotective effects of anethole through anti-inflammatory, anti-apoptotic, and antioxidant mechanisms against rotenone-induced toxicity in rats.

Keywords : Anethole; Anxiety; Depression; Neuroinflammation; Parkinson’s disease; Rotenone.

Count: 263
Abstract ID: 561
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Comparison of behavioral indices of rats under administration of low, medium and high doses of harmaline

Submission Author: Mona Mansourian

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Background and Aim : Harmaline is a psychoactive substance that has been shown to induce a range of behavioral changes in rodents, including tremorgenic effects. In this study, we aimed to investigate the dose-dependent effects of harmaline on the behavioral indices of rats.

Methods : Harmaline was administered at low (30 mg/kg), medium (50 mg/kg), and high (100 mg/kg) doses to separate groups of 8 rats weighing 40-60 grams. Various tests were conducted to assess locomotor activity and exploratory behavior, including rearing, grooming, time on rotarod, hanging experiences, step width, step lengths, and tremor scores.

Results : The results showed that harmaline administration did not significantly affect the number of rearing and grooming behaviors. However, significant differences were observed in the time on the rotarod between the low dose group and the higher dose groups, indicating impaired motor coordination at higher doses. Differences in hanging experiences and tremor scores were also observed, suggesting effects on grip strength and tremor induction. Furthermore, significant differences in left step length were found, indicating an impact on gait.

Conclusion : These findings emphasize the dose-dependent effects of harmaline on behavioral indices in rats and highlight the need for further research to understand the underlying mechanisms. The results of this study may have implications for the use of harmaline in animal models of neurological disorders and for investigating potential therapeutic applications.

Keywords : Harmaline, Psychoactive, Tremor, Neurotoxin, Herbal medicine

Count: 264
Abstract ID: 459
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Ceftriaxone improves senile neurocognition damages induced by D-galactose in mice

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Background and Aim : Ceftriaxone (Cef), a beta-lactam antibiotic, is accompanied by antioxidant and anti- inflammatory properties. It has been shown that Cef has beneficial effects on Alzheimer's disease. In the current investigation, the effect of Cef in a mice model of aging was investigated.

Methods : Forty male mice were equally aliquoted into four groups as follows: Control (as healthy normal animals), D-galactose (DG) group (treated with 500 mg/kg/day DG for 6 weeks), DG + Cef group (treated with DG plus Cef 200 mg/kg/day for 6 weeks), and Cef group (treated with Cef 200 mg/kg/ day for 6 weeks). A battery of behavioral tests was done to evaluate age-related neurocognitive changes. The activities of catalase (CAT), glutathione peroxidase (GPx), and superoxide dismutase (SOD), as well as the level of malondialdehyde (MDA) in the brain, were measured by biochemical methods. Also, to determine the brain damage, histopathological alterations in the hippocampus were measured using hematoxylin and eosin (H&E) staining.

Results : Our results indicate that neurobehavioral dysfunctions of DG can be prevented by co-administration of Cef. We also found that Cef increases the activity of SOD, GPx, and CAT as well as decreasing the level of MDA in the brain of aged mice.

Conclusion : Based on our findings, Cef declines neurocognitive dysfunctions in the DG-induced model of aging, possibly through its antioxidative properties.

Keywords : Aging; Ceftriaxone; D-galactose; Mice; Oxidative stress

Count: 265
Abstract ID: 483
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Effects of Tetrahydrocannabinol Treatment on Hippocampal Tissue Analysis

Submission Author: Adele Naghshbandieh

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Background and Aim : The hippocampus, an essential component of the limbic system in the central nervous system, is heavily influenced by tetrahydrocannabinol (THC), the primary psychoactive compound in marijuana, due to its abundant expression of type 1 cannabinoid receptors (CB1). This study aimed to investigate the effects of THC treatment on the hippocampal tissue of rats.

Methods : Twenty-four adult male Wistar desert rats weighing approximately 300-320 grams were randomly divided into control and experimental groups. The THC group received intraperitoneal injections of THC for eight days, and tissue analysis was conducted using the optical dissector method to measure the total number of neurons and glial cells. Data were analyzed using SPSS software, and the mean values of the two groups were compared using the t-test. Significant changes were considered at $P < 0.05$.

Results : The stereological counting of neurons in the hippocampal region showed a significant reduction in neuronal density in the THC group compared to the control group ($P < 0.001$). However, the number of glial cells significantly increased under THC treatment ($P < 0.001$).

Conclusion : The findings suggest that THC treatment can negatively impact the hippocampal region by reducing the number of neurons and altering its function

Keywords : Tetrahydrocannabinol, hippocampus, Neurodegeneration

Count: 266
Abstract ID: 576
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigation of the simultaneous administration effects of Levodopa, Benserazide, and Nortriptyline in an experimental laboratory model of Parkinson's in rats,

Submission Author: Emad Gholami

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Background and Aim : Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by a spectrum of debilitating symptoms such as memory impairment, movement disorders, and postural instability. Despite ranking as the second most prevalent neurodegenerative disease following Alzheimer's, effective therapeutic strategies addressing the complex nature of PD remain a critical pursuit. This study aims to investigate the combined efficacy of nortriptyline at three different doses, administered in conjunction with Levodopa and Benserazide, with the goal of elucidating potential synergistic effects.

Methods : In this experimental study, 49 male rats were randomly allocated into seven groups. Parkinson's disease was induced in five groups through neurotoxin injection. The sixth group underwent stereotaxic surgery without developing Parkinson's disease, functioning as the sham group. The seventh group remained untreated and served as the healthy control. Among the Parkinson's groups, the first received no treatment (control), the second received Levodopa (10

mg/kg) and Benserazide (2.5 mg/kg), and the third to fifth groups received nortriptyline at doses of 5, 10, and 20 mg/kg, respectively. Pathophysiological changes were recorded through histological tests, while behavioral changes were measured using the direct observation swing test, open field tests, and the Elevated Plus Maze. Data were statistically analyzed using SPSS software, version 24, with a significance level set at less than 0.05.

Results : In this study, the effects of nortriptyline, administered at doses of 5, 10, and 20 mg/kg alongside levodopa and benserazide, were investigated in a rat model of Parkinson's disease. The results showed a significant increase in the mean number of neurons in the substantia nigra region with nortriptyline treatment compared to the control group. While dopaminergic neuron counts differed significantly between the control and sham groups, there was no significant difference between the treatment and control groups. Notably, the behavioral assessments revealed nuanced effects, with the 10 mg/kg nortriptyline dose exhibiting higher values in the second swing test but lower values in the fourth swing test compared to the control group. The 20 mg/kg nortriptyline group showed no significant differences in most swing test values, indicating a potential dose-dependent impact on behavior. Conversely, the therapeutic group receiving standard levodopa and benserazide exhibited a significant reduction in dopaminergic neurons compared to normal and sham groups. Overall, the study highlights the potential neuroprotective effects of nortriptyline and suggests that the 10 mg/kg dose, in combination with levodopa and benserazide, may offer the most favorable outcomes in mitigating both neuronal loss and behavioral symptoms in Parkinson's disease.

Conclusion : Our findings reveal that the addition of nortriptyline, particularly at a 10 mg/kg dose, to levodopa and benserazide did not significantly differ in increasing the number of dopaminergic neurons compared to the control group. However, notable behavioral changes in animals treated with varying doses of nortriptyline alongside levodopa and benserazide were observed, with the most significant effect noted at the 10 mg/kg nortriptyline dose, resulting in reduced negative behaviors. The swing test criteria in the four assays underscore the superior efficacy of drug therapy containing nortriptyline, especially at a 10 mg/kg dose, in conjunction with levodopa and benserazide.

Keywords : Parkinson disease , levodopa , nortriptyline , benserazide

Count: 267
Abstract ID: 195
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigation of the Inflammatory Genes and IL-17 Concentration in Patients With Multiple Sclerosis

Submission Author: Pourya Rokhsartalaba Azar

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Background and Aim : Multiple Sclerosis (MS) is a neuronal cells' autoimmune disease that leads to chronic inflammatory immune response in the central nervous system (CNS). The disease pathogenesis results from irregular activation of immune cells that consequently destroy the neuronal myelin sheath. Although many studies have been researched on immunopathology and etiology of neuroinflammation in multiple sclerosis, subtype-related alterations haven't yet been explored properly.

Methods : We used the RT-PCR method to measure the expression levels of IL-17, CX3CR1, IP-10, mTOR, STAT3, and NLRP3 genes in peripheral blood mononuclear cells (PBMC) of 40 relapse remitting and 20 secondary progressive multiple sclerosis patients.

Results : Among them, the relative expression levels of NLRP-3 and STAT3 showed a significant increase in secondary progressive (SP) compared to relapse remitting (RR) patients. Furthermore, we measured the characteristic cytokine IL-17 serum level in the patient's serum and didn't find a significant correlation between the primary and secondary progressive forms of patients.

Conclusion : Our findings suggest that finding more inflammatory-related gene expression with high patient samples may be useful for monitoring disease activity and developing future subtype-specific therapies.

Keywords : Multiple Sclerosis, RT-PCR, STAT3, NLRP-3.

Count: 268
Abstract ID: 323
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

ALLOGENEIC SPERM HEAD MODULATES T CELL POLARIZATION LOCALLY AND SYSTEMICALLY IN ANIMAL MODEL OF ALZHEIMER'S DISEASE

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Background and Aim : Alzheimer's disease (AD) is represented by accumulation of amyloid-β (Aβ), inflammatory microenvironment, and imbalances in polarization of T cell pattern. Similar to tumor, high levels of anti-inflammatory regulatory T cells (Tregs) along with persistent chronic inflammatory condition is observed in the brain. There's no consensus regarding Treg manipulation to achieve AD cure. Different opposing strategies attempted to deplete or strengthen Tregs to treat AD. Our previous report revealed therapeutic efficacy of allogeneic sperm head on brain structure and function in animal model of AD. In this study, we evaluated how sperm head therapy affects pattern of T cell polarization in AD animal model.

Methods : To do so, animal model of rat AD was induced by injection of Aβ, a pool of allogeneic sperm head was prepared and administered. Then the brain, cervical lymph nodes, and spleen were isolated. The levels of IFN-γ, IL-4, IL17, and FoxP3, as representative of T-helper (Th1), Th2, Th17, and Treg, respectively, was determined in the dissected tissues using immunohistochemistry.

Results : Results demonstrated that allogeneic sperm head had modulating effects on T cell pattern of polarization. Th1, Th17, and Treg responses were markedly decreased and Th2 response was significantly increased locally and systemically.

Conclusion : This nature-based approach has the potency to re-orchestrate T cell response locally and systemically. Considering brain as a low-repairing organ, cell therapy using allogeneic sperm head modulates T cell response along with promotion of repair and remodeling. Such an immunomodulatory effects of allogeneic sperm head can be applicable to other organs with more reparative potency.

Keywords : Alzheimer's, sperm, T-cell-pattern/function, repair/regeneration, cell-therapy, allogeneic, spleen, lymph node

Count: 269
Abstract ID: 184
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Monitoring the effectiveness of Betanin small molecule and its analogs on the inhibition of alpha-synuclein fibrillation and its cytotoxicity

Submission Author: Ayda Ghahari

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Background and Aim : Parkinson's disease (PD) is the second common Neurodegenerative disorder in the world. In PD, natural and soluble structure of alpha-synuclein protein (αSN) converts into insoluble pathological aggregates. Decreasing in natural form of αSN causes disruption of vesicle traffic in synaptic terminals and also increases ROS amounts in neurons that finally can induce apoptotic cell death especially in dopaminergic neurons. Nowadays, many researchers have focused on small molecules that can inhibit αSN aggregation and also prevent cytotoxicity of αSN aggregates. Betanin is a kind of Betalain that extracted from Beta vulgaris. This glycosidic small molecule has been shown to have anti-oxidative effects but we found Betanin also has disaggregating effects on αSN that makes it a potential drug for PD.

Methods : First, the effect of betanin treatment on the fibrillation and defibrillation process of αSN was evaluated by methods such as fluorescence microscopy, thioflavin T fluorescence emission intensity measurement, and SDS-PAGE. Then the effect of the treatment on the secondary nucleation and seeding process was investigated. along with it the neurotoxicity of studied compound was tested on SH-SY5Y cells as in vitro model of neuronal function and differentiation using MTT assay.

Results : Betanin partially inhibited the fibrillation process that demonstrated with spectrofluorimetry and fluorescence microscopy assay. The MTT assay demonstrated that the

administration of the investigated compounds, ranging from 50 to 200 µM, did not induce any substantial alterations in the viability of SH-SY5Y cells.

Conclusion : Considering the rapid spread of PD worldwide, it is very important to find effective treatment methods for Parkinson's. This study for first time revealed that betanin and some of its derivatives , as water soluble natural small molecule, in addition to their antioxidant activity can directly affect the different pathways of αSN aggregation.

Keywords : Parkinson’s Disease’; Small molecule; Betanin; alpha- synuclein

Count: 270
Abstract ID: 406
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Differential gene expression analyses of PD and their role in different mechanisms and how they affect the propagation of disease

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Background and Aim : Parkinson's disease (PD) is the second devastating neurodegenerative disorder characterized by bradykinesia, rigidity, and postural instability. Despite the rapid expansion of data on PD's genetic factors in recent years, the cellular degeneration mechanism remains unclear. To gain insight into the mechanisms underlying PD progression, it is crucial to integrate information on the constituent parts of the organism and develop a comprehensive and holistic model for analysis. The gene network comprises numerous molecules, and their interconnections occur within the cell. To gain a better understanding of the disease mechanism and provide more effective suggestions for drug targets and treatments, various in silico programs are employed to reconstruct and remodel these networks

Methods : Data collection Establishment of the protein–protein interaction network Network construction and analysis Gene enrichment analysis

Results : Data collection by GEO and analyses to predict overexpressed and under expressed genes Establishment of the protein-protein interaction network by String to search the connection of highly genes proteins and how they interact in disese to normal Network construction and analysis by Cytoscape to find hub genes Gene enrichment analysis by enrichr Maayan and finding hub genes mechanisms and pathways with kegg and Reactome We constructed a PPI network with target genes based on the STRING database. A node was used to represent each protein, and lines were used to demonstrate the interactions between nodes. The connection degree was defined as

the number of lines linked to a certain node. A connection degree more extraordinary than five was used to identify hub genes.

Conclusion : Comparative gene-expression study of cells with various biological types is one of the main uses of gene-array behavior technologies.In the end, these investigations will produce a thorough knowledge of the molecular mechanisms of many different clinical diseases. Gene-array analysis, as compared to single-gene or single-protein investigations, provides an overall picture of changes in gene expression in abnormal states. Given that these genes' changes in expression were discovered to be statistically significant, one could be led to assume that these genes play a major part in Parkinson's disease.

Keywords : PD, Gene expression, Gene Function, GEO, STRING,GR2, ENRICH R

Count: 271
Abstract ID: 238
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Evaluation of Upper Extremity Kinematic Synergies in Parkinson's Patients in ON and OFF Medication States

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Background and Aim : Parkinson's disease is a neurodegenerative disorder characterized by motor impairments, including abnormal movement patterns and loss of coordination. The synergy hypothesis is a commonly used hypothesis in the evaluation of patients, including those with Parkinson's disease. When performing any movement, the central nervous system must coordinate the contraction of multiple muscles. Each muscle is regulated by motor units that control the internal dynamics of muscle fibers. Due to the redundancy of muscles compared to joints, there are numerous combinations of muscle patterns that can produce the same movement. Understanding how the central nervous system manages this redundancy is a crucial goal in motor neuroscience. One idea is that motion control can be simplified through a modular structure. This hypothesis suggests that control can be achieved by adjusting the selection of motor modules, known as muscle synergies, which leads to simplified motion control.

Methods : A dataset of 33 PD patients was used, with each patient performing 24 upper extremity tasks in both medication states. Each task was repeated six times while the patients were seated on a chair. The number of synergies, as well as their structure, activation and timing were calculated. The analysis focused on four degrees of freedom (DOFs) corresponding to shoulder angles (flexion/extension, abduction/adduction, internal/external rotation) and elbow angle (flexion/extension). Eulerian angles were used for angle calculation, and Non-Negative Matrix Factorization (NNMF) was employed for synergy extraction. The number of synergies was determined using the Global Variance Accounted For (VAF) method.

Results : Kinematic synergy analysis aimed to uncover the coupling between the movements across different DOFs and identify the fundamental movement maneuvers (synergy modules) that constitute the motor task. Preliminary results indicate that the number of synergies their structure and timing do not exhibit significant changes with medication state.

Conclusion : Further investigations are required to explore additional factors contributing to kinematic synergy alterations in PD. The results of our study, indicate a significantly larger number of modules for all Bi-Manual reaching tasks compared to all Uni-Manual reaching tasks ($p<0.05$). This finding reflects the higher motor complexity associated with bi-manual tasks. However, it is worth considering that increasing the number of clusters to include sub-clusters may result in a larger coverage percentage (as shown in Table 1 and 2) of more than 90%. This could potentially lead to the identification of better representative modules of synergies.

Keywords : Parkinson's disease; kinematic synergy; dopaminergic therapy; upper extremity tasks; Kinect V1 data

Count: 272
Abstract ID: 145
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Four mutations in C20orf54 identified in Brown–Vialetto–Van Laere syndrome

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Background and Aim : Brown–Vialetto–Van Laere syndrome (BVVLS) is a very rare neurodegenerative disorder characterized by pontobulbar palsy and sensorineural hearing loss. Its mode of inheritance in affected families has usually been autosomal recessive, although autosomal dominant inheritance and incomplete penetrance have also been reported. Recently, C20orf54 was identified as a causative gene for BVVLS. Twelve different mutations have so far been identified in 10 patients affected with BVVLS or the related disorder Fazio Londe syndrome.

Methods : The exons and flanking intronic sequences of C20orf54 were amplified from DNA of leukocytes of three BVVLS-affected individuals. Amplicons were sequenced using the ABI Big Dye terminator chemistry and an ABI Prism 3700 instrument (Applied Biosystems, Foster City, CA, USA). Sequences were analyzed with the Sequencher software (Gene Codes Corporation, Ann Arbor, MI, USA). Reference sequences used were NC_000020.10,NM_033409.3 and NP_212134.3.

Results : Here, results of screening of C20orf54 in three unrelated BVVLS patients are reported. Four novel mutations that affect amino acid changes, p.Asn21Ser, p.Pro220His, p.Ala312Val and p.Gly375Asp, were identified in the patients. The causative nucleotide variations were not observed in 200 control individuals. One of the patients harbored compound heterozygous mutations, but only one mutated allele was observed in each of the two remaining patients.

Conclusion : In any case, as association between C20orf54 and BBVLS has only recently been identified and the mode of inheritance of the disorder has not always been clear-cut, further screening of C20orf54 in BVVLS patients is warranted.

Keywords : Brown–Vialetto–Van Laere syndrome; C20orf54; mutation screening; neurodegenerative disorders; pontobulbar palsy

Count: 273
Abstract ID: 155
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Exosomal microRNAs: the role from diagnostic to therapeutic applications in Alzheimer's Disease

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Background and Aim : -Alzheimer's disease (AD) is the most common type of progressive neurodegenerative disorder that is marked by memory loss and cognitive dysfunction. It is a complex disease with both environmental and genetic components. The current diagnosis of AD is based on the analysis of the cognitive function in the patient using imaging techniques and biochemical analysis of bodily fluids. Efforts have been made to develop an effective therapeutic approach and a diagnostic tool for identifying AD before the onset of irreversible neurological damage.

Methods : -A literature search from 2014 until 2023 was conducted using Medline, CINAHL, PubMed, and Google Scholar. Thirteen studies were included. Most studies excluded did not encompass caregivers' perspectives. Four reviewers screened the titles, abstracts, and full texts of the articles for inclusion Studies included were original peer-reviewed articles in English. Currently, exosomal miRNAs present in biological fluids are recognized as good disease-related markers and have emerged as a powerful tool for solving many problems in both the diagnosis and treatment of AD patients. In this review, we summarize recent advances in the function of exosomal miRNAs in AD pathology and exosomal biomarkers, with a focus on the potential of miRNAs as diagnostic biomarkers in AD and the use of exosomes in the delivery of miRNAs which may lead to profound developments in the field of macromolecular drug delivery.

Results : -Recent researches have revealed that exosomes mediate the horizontal delivery of distinct RNAs in intercellular communication. The utilization of exosomes for transport of certain

therapeutic nucleic acids to recipient cells is considered a potential approach for AD. The involvement of exosomal miRNAs with the pathogenesis of neurodegenerative disorders urges researchers to investigate their therapeutic potential too.

Conclusion : Whether miRNAs can be used in AD diagnosis, alone or in combination with other AD biomarkers (amyloid and tau), warrants further investigation. Hence, future studies are required for better neuropathological validations, and greater sample sizes are needed for robust statistical power to develop a credible tool for AD diagnosis. Also, further, the effects of miRNAs on the initiation and progression of AD should be specific goals determined. This approach may allow researchers more time to halt or slow the onset of this progressive disorder.

Keywords : Alzheimer's disease Exosome microRNAs Cognitive dysfunction

Count: 274
Abstract ID: 214
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Comparative evaluation of donepezil and hyssopus officinalis extract on the expression of TNF-α in an rat model of Alzheimer's disease

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Background and Aim : Alzheimer's disease (AD) is a progressive disease with complex pathophysiology. Nowadays, inflammation is considered as a very important factor in the pathophysiology of neurological diseases. When damage occurs to nerve cells, TNF-α is clearly upregulated. Donepezil, as one of the approved drugs for the treatment of AD, has aroused great interest for researchers. This drug creates neuroprotective effects by affecting the cellular and molecular processes of neurodegeneration. Hyssopus officinalis extract contains anti-inflammatory substances and is used in the treatment of nervous and mental diseases and improving memory. The aim of this study was to investigate the effect of combined injection of donepezil and hyssopus officinalis extract on inflammatory factor caused by streptozotocin (STZ) injection.

Methods : The experimental groups include: Sham, STZ, STZ + three doses of hyssopus officinalis extract (25, 50 and 100 mg/kg), STZ + donepezil (0.75 mg/kg) and STZ + effective dose of hyssopus officinalis + donepezil. In each group, there were 8 male Wistar rats weighing 200-250 grams. To induce Alzheimer's model, STZ was injected intraventricularly (3 mg/kg; 3 µl per ventricle). After 4 weeks, the level of TNF-α expression was measured by western blot method and used to investigate neuroinflammation. After the confirmation of Alzheimer's induction, donepezil, hyssopus officinalis extract and their combined injection were used intraperitoneally for 21 days.

Results : The results of the study showed that STZ injection caused a significant increase in neuroinflammation compared to the sham group. Treating rats with an effective dose of hyssopus officinalis extract or donepezil significantly reduced neuroinflammation, but their simultaneous injection could significantly reduce neuroinflammation caused by STZ.

Conclusion : The use of hyssopus officinalis extract along with donepezil can provide a more effective treatment method to reduce neuroinflammation in Alzheimer's patients.

Keywords : Alzheimer's disease, neuroinflammation, donepezil, hyssopus officinalis extract

Count: 275
Abstract ID: 94
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Effects of Boswellia resin (olibanum) on the histological structure of hippocampus in aged rat

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Background and Aim : The hippocampal formation shows age-related morphological changes that could cause memory decline. Although there is growing evidence indicates the extract of Boswellia resin (olibanum or frankincense) attenuates hippocampal-dependent memory deficits in aged individuals, very little is known about the effect of Boswellia on the structure of hippocampus. Therefore, this study aimed to investigate the effect of Boswellia treatment on the morphology of hippocampus in aged rats.

Methods : Sixteen male Wistar rats, 24 months of age, were randomly divided in experimental (n=8) and control (n=8) groups. Experimental group was orally administered Boswellia serrata gum resin(received as a gift from Goldarou phytolaboratory, Isfahan, Iran) daily 100 mg/kg for 8 weeks and the control group received a similar volume of water. At the end of experiment, the brain was removed and divided into two hemispheres. One hemisphere was selected at random for stereological studies and the other for morphometric analysis. One hundred µm thick sections were cut along the entire extent of the hippocampus. The Cavalieri principle was employed to estimate the volume of hippocampus. The total numbers of granule cells in the hippocampus were estimated with the optical fractionator. The rotator method was applied to estimate the individual volume of neurons. A quantitative Golgi study was used to analysis of dendritic trees of hippocamal neurons.

Results : Mean brain weights of Boswellia treated rats and respective controls were 1.59±0.08 and 1.52±0.12 g, respectively (p=0.11). Our study showed that Boswellia-treated aged rats had significant greater hippocampal dentate gyrus (11.5±1.29 mm3) compared to their non-treated counterparts (10.2. ±1.12 mm3). Comparisons also revealed the long-term treatment with Boswellia, resulted in an increase in neuronal volume of hipocampal granule neurons (741±78 Vs 625±61 µm3, p=0.005). There was no significant difference in the total number of granular layer

neurons of Boswellia-treated and control animals. Comparisons between two groups revealed that the total number of dendritic segments of the granular neurons was higher in the experimental group (20.9 ± 2.03 μm) than in controls (16.5±2.00, p=0.001). Results also showed that, in these neurons, the total dendritic length was larger in Bs-treated (1522 ± 149.1 μm) than control animals (1344± 83.6 μm, p=0.011).

Conclusion : This study indicated that chronic administration of Boswellia resin in the aged Wistar rat increases the volume of hippocampal dentate gyrus and somal size of its granule cells. It also indicated that there is extensive dendritic arbors in hippocampal granule cells of Boswellia-treated aged rats. We therefore propose it as a novel potential neuroprotective agent and therapeutic potential of Boswellia resin in hippocampal degenerative diseases and in age-associated memory decline and should be considered. This study also provided a neuroanatomical substrate that may be relevant to previously reported memory improvement in Boswellia-treated aged rats.

Keywords : Aging, Boswellia resin, Hippocampus, Stereology, Morphology

Count: 276
Abstract ID: 174
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Increased Crash Rate in Drivers with Parkinson's Disease: An Evidence-based Review

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Background and Aim : Parkinson's disease (PD) is a neurodegenerative movement disorder that results from the neural dopaminergic cell death in the midbrain substantia nigra pars compacta (SNc). PD is the second most common disorder of aging, and the global prevalence of PD is believed to be up to 10 million people. PD is a syndrome with a wide spectrum of clinical symptoms and causes physical, cognitive, and visual impairment. These impairments include bradykinesia, rigidity, tremor, freezing, poor attention and visuospatial awareness that can affect their occupation with a focus on driving. Driving a motor vehicle represents an important activity associated with personal independence and freedom; Being told that one can no longer drive is associated with loss of independence, depression, self-steam and reduced activities. In this article, we aimed to evaluate that to what extent the adverse effects of such neurodegenerative disease can influence the occupation of PD drivers and the immunity of the society. One obvious way of investigating driving safety in PD is to investigate the rate of motor vehicle crashes in this population.

Methods : This study was conducted reviewing the article published between 2005 to 2023 using Google scholar, PubMed, Scopus, Web of Science, and searching libraries, with keywords such as Parkinson's disease, neurodegeneration, driving, crash rate, cognition. A total of 75 original and review articles related to this topic were used to write this article.

Results : There are some studies systematically evaluating safety of PD patients when driving. Most studies suggested that overall, PD drivers are less safe than the general population. Declines in cognitive abilities (judgement, memory, and visuospatial skills), motor function (reaction time, and coordination of movement), the ability to stay awake/alert, and a person's perception of their own abilities are adversely affected in PD drivers in comparison with healthy population. For instance, in a survey involving 5000 PD, 15% reported being involved in, and 11% causing a crash in the preceding 5 years which happened due to indecisiveness in T-junctions and reduced using of mirrors. one study demonstrated increased risk of crashes per million miles traveled, in those with greater diseases severity. Another study with smaller population (n=15) found that almost a third of patients thought that their PD symptoms may have contributed to a recent crash involving another vehicle. A larger study (n=60) found that individuals with PD were more likely to have reported a crash in the past 5 years compared to control group.

Conclusion : Driving is impaired in majority of patients with PD and progressively worsens resulting in early driving in cessation and possibly increased risk of crashes. While general guidelines on fitness to drive have been proposed, each patient should be evaluated individually with periodic follow up. Additionally, retirement from driving is recommended for patients in an advanced motor stage. Research on rehabilitation of driving skills in PD and automation of driving to maintain vehicular mobility is in progress.

Keywords : Parkinson's Disease; Neurodegeneration; Driving; Crash Rate; Cognition

Count: 277
Abstract ID: 191
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Therapeutic potential of sodium butyrate in neurodegenerative diseases

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Efforts to discover effective therapeutic agents for neurodegenerative diseases (NDDs) that are associated with neurotoxicity, inflammation, and oxidative stress have remained challenging. Histone deacetylases (HDACs) are overexpressed in NDDs, and recent studies suggest histone deacetylase inhibitors (HDACIs) as a potential therapy for treating these devastating diseases. Sodium butyrate (NaB) functions as an HDACI and reactivates epigenetically silenced genes by heightening histone acetylation. NaB is a short-chain fatty acid produced in the gut and found in the diet that reportedly ameliorates several conditions, such as NDDs, cancer, obesity, inflammation, etc. NaB maintains gut microbiota and provides neuroprotection in cerebral diseases. It can bypass the blood-brain barrier (BBB) and acts as an anti-inflammatory, anti-oxidant, and anti-apoptotic factor, enhances memory performance and cognitive function, and improves motor symptoms in the central nervous system. Its beneficial effects have been observed in many NDDs, such as Alzheimer’s disease, Parkinson’s disease, Huntington's disease, etc. Therefore, this anaerobic synthesized substance, NaB, can be considered a promising agent in the supplementation and treatment of neurodegenerative impairments alongside neurological drugs. Here, we reviewed the therapeutic effects of NaB in in vitro and in vivo models of various NDDs.

Keywords : Sodium butyrate; neurodegenerative diseases; anti-inflammatory; anti-oxidant; anti-apoptotic; neuroprotection

Count: 278
Abstract ID: 384
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Exploring the Role of NOS2 Gene Expression in the Pathogenesis of Alzheimer's Disease: A Case-Control Study

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Background and Aim : Alzheimer's disease (AD) is a progressive neurological disorder that is characterized by the gradual deterioration of cognitive function. It is the most common form of dementia, and its prevalence is increasing as the population ages. The cause of AD is not fully understood, but researchers have identified several genetic and environmental factors that may contribute to its development. One gene that has been implicated in the pathogenesis of AD is the NO synthase 2 (NOS2) gene. This gene encodes for an enzyme that produces nitric oxide (NO), a signaling molecule that plays a role in many physiological processes, including blood vessel dilation and immune system regulation. However, excessive production of NO can lead to oxidative stress, a condition in which reactive oxygen species (ROS) are generated and cause cellular damage. Oxidative stress has been identified as a key feature of AD pathology, with evidence indicating that it can exacerbate the accumulation of amyloid beta (Aβ) protein and tau tangles, which are hallmarks of the disease. The aim of this study is to investigate the possible association of NOS2 gene expression with Alzheimer's disease occurrence.

Methods : In this case-control study, blood samples were collected from AD patients and control subjects. RNAs were extracted with Trizol reagent. Oligo7 software was used to design specific primers for NOS2 gene. RNAs were reversely-transcribed into cDNA. Real-time PCR were performed to calculate expression levels of interest gene. Data analyses were conducted using GraphPad Prism software.

Results : According to previous studies, it is expected that NOS2 gene will have increased expression in Alzheimer's disease which our results confirm this so far.

Conclusion : Our findings may help to explain the underlying molecular mechanism of AD and may show a molecular marker of the AD diagnosis.

Keywords : Alzheimer's disease; NOS2; Gene expression; Stress oxidative; Neuroinflammation

Count: 279
Abstract ID: 119
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Minocycline effects on memory and learning impairment in the beta-amyloid-induced Alzheimer's disease model in male rats using behavioral, biochemical, and histological methods

Submission Author: Zahra Gholamimahmoudian

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Background and Aim : Alzheimer's disease (AD), as an advanced neurodegenerative disease, is characterized by the everlasting impairment of memory, which is determined by hyperphosphorylation of intracellular Tau protein and accumulation of beta-amyloid (Aβ) in the extracellular space. Minocycline is an antioxidant with neuroprotective effects that can freely cross the blood-brain barrier (BBB). This study investigated the effect of minocycline on the changes in learning and memory functions, activities of blood serum antioxidant enzymes, neuronal loss, and the number of Aβ plaques after AD induced by Aβ in male rats.

Methods : Healthy adult male Wistar rats (200–220g) were divided randomly into 11 groups (n=10). The rats received minocycline (50 and 100 mg/kg/day; per os (P.O.)) before, after, and before/after AD induction for 30 days. At the end of the treatment course, behavioral performance was measured by standardized behavioral paradigms. Subsequently, brain samples and blood serum were collected for histological and biochemical analysis.

Results : The results indicated that Aβ injection impaired learning and memory performances in the Morris water maze test, reduced exploratory/locomotor activities in the open field test, and enhanced anxiety-like behavior in the elevated plus maze. The behavioral deficits were accompanied by hippocampal oxidative stress (decreased glutathione (GSH) peroxidase enzyme

activity and increased malondialdehyde (MDA) levels in the brain (hippocampus) tissue), increased number of Aβ plaques, and neuronal loss in the hippocampus evidenced by Thioflavin S and H&E staining, respectively.

Conclusion : Minocycline improved anxiety-like behavior, recovered Aβ-induced learning and memory deficits, increased GSH and decreased MDA levels, and prevented neuronal loss and the accumulation of Aβ plaques. Our results demonstrated that minocycline has neuroprotective effects and can reduce memory dysfunction, which are due to its antioxidant and anti-apoptotic effects.

Keywords : Alzheimer disease; Minocycline; Morris Water Maze; Rats; Hippocampus

Count: 280
Abstract ID: 120
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Minocycline effects on the beta-amyloid-induced memory and learning deficit in male rats: a behavioral, biochemical, and histological study

Submission Author: Zahra Gholamimahmoudian

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Background and Aim : The present study was designed to investigate the potential protective effects of Minocycline against Aβ- induced AD, recognition memory decline, and possible involvement of anti-apoptotic mechanisms.

Methods : Minocycline (50, and 100 mg/kg/day; P.O.) was administered to rats before, after, and before/after AD induction, and it was continued for 30 days. Behavioral functions were assessed by employing standard behavioral paradigms at scheduled points in time. Then TAC and TOS were assayed in blood serum using ELISA kits. Moreover, apoptosis and plaques amyloid were examined by TUNEL and Congo red staining, respectively.

Results : The results indicated that treatment of AD rats with minocycline improved memory deficit in the PAT and can improve a decline in recognition memory in the NOR test. Minocycline at 50 and 100 mg/kg significantly reduced the TOS levels and increased the TAC levels ($P< 0.0001$). as well as Minocycline at 50 and 100 mg/kg reduced the apoptotic index in the hippocampus of ALZ rats. After Congo red staining the Minocycline group was found to improve cell morphology and markedly fewer Aβ plaques.

Conclusion : Our results demonstrated that minocycline reduced memory and learning dysfunction in behavioral experiments after Aβ injection, which may be owing to improved synaptic function, neural flexibility, anti-inflammatory and anti-apoptotic.

Keywords : Alzheimer Disease. Minocycline. Apoptosis. Rats. Hippocampus.

Count: 281
Abstract ID: 108
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The neuroprotective effects of progesterone against peripheral neuropathy: a systematic review of non-clinical studies

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Peripheral neuropathy (PN) is one of the most usual disorders that affect the function of one or more peripheral nerves, with an incidence of 77/100,000 people per year and a prevalence of 1–12% in all age groups, which increases to 30% in the elderly. PN may be inherited, such as a group of diseases altogether known as Charcot–Marie–Tooth disease (CMT) including demyelinating and axonal variants, or acquired, like what happens during the aging process, after physical injury, in infections, in systemic or metabolic disorders, autoimmune disorders, during drug treatment, and after exposure to toxic compounds. Despite the widespread prevalence and devastating effects of PN, there is no effective treatment that can stop or reverse it. A possible strategy to find a more effective treatment for PN could be to focus on new biological targets such as those that are involved in related molecular events in the peripheral nerves. Recent observations have shown that peripheral nerves are able to synthesize and metabolize neuroactive steroids and express their receptors. So, peripheral nerves are a target for neuroactive steroids action. Indeed, neuroactive steroids play an important role in regulating various peripheral nerves functions, including Schwann cell proliferation and myelination. From this perspective, new therapeutic strategies based on neuroactive steroids may be a promising option for PN and some studies have confirmed this hypothesis. Progesterone is one of the most important neuroactive steroids which are synthesized in the nervous system and its receptors are placed on the neurons and supporting cells in the nervous system. It is well demonstrated that progesterone has neurotrophic and neuroprotective roles for the development and regeneration of the peripheral nervous system. The purpose of this study was to conduct a review of progesterone's potential neuroprotective properties against PN. A full systematic search was conducted in several electronic databases (Scopus, PubMed, and Web of Science) up to March 2023 under the PRISMA guidelines. Seventy-eight studies were screened using predefined inclusion and exclusion criteria. Finally, the current systematic review included sixteen publications that met the inclusion criteria. According to in

vivo findings, progesterone treatment reduces PN via inhibition of biochemical and morphological abnormalities induced by any of aging, diabetes, chemotherapy and physical injury in peripheral nerves. However, compared to the PN groups alone, progesterone treatment exhibited anti-oxidant, anti-inflammatory, antinociceptive, and neuroregenerative trend. According to other research, PN also significantly produces biochemical alterations in neuron cells/tissues. Additionally, histological alterations in peripheral nerves tissue following PN were detected. Nonetheless, in the majority of cases, these biochemical and histological alterations induced by diabetes, chemotherapy and physical injury were reversed when progesterone was administered. It is worth noting that the administration of progesterone ameliorates the PN. Progesterone exerts these neuroprotective effects via inhibition of various mechanisms involved in PN.

Keywords : Peripheral neuropathy, progesterone, systemic review

Count: 282
Abstract ID: 73
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Protection of dopaminergic neurons by rilmenidine in the 6-hydroxydopamine model of Parkinson's disease

Submission Author: Ali Dehghaninejad

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Background and Aim : Background: Parkinson's disease (PD) is the second most common neurodegenerative disease characterized by progressive loss of dopaminergic (DA) neurons in the substantia nigra (SNpc) and decreased DA innervation in the striatum. Purpose: In this study, we investigated the protection of dopaminergic neurons by rilmenidine in the 6-hydroxydopamine model of Parkinson's disease

Methods : : 30 Wistar rats were randomly divided into three groups: sham, lesion, and treatment. In all groups, behavioral assessment with apomorphine was performed one week before and four weeks after surgery. In the treatment group, 1.5 mg/kg rilmenidine was injected intraperitoneally for four days after surgery. Microscopic examination of the substantia nigra was performed after preparation of brain tissue blocks, Nissl staining, photography of slides, and counting of neurons. The number of rotations and cells were analyzed using ANOVA and Tukey, and the changes before and after surgery were compared using the paired t-test. The significance level was set at $p \leq 0.05$.

Results : The number of rotations and substantia nigra neurons in the treatment group significantly decreased and increased, respectively compared to the lesion group.

Conclusion : Rilmenidine may prevent the destruction of substantia nigra neurons by 6-hydroxydopamine through its protective effect.

Keywords : Parkinson's disease, Rilmenidine, Nissl staining, autophagy, substantia nigra, striatum, 6-hydroxydopamine.

Count: 283
Abstract ID: 242
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Comparison of Anterior and Posterior Surgical Approaches to Degenerative Cervical Myelopathy: A Systematic Review and Meta-analysis

Submission Author: Sepehr Khosrabi

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Introduction: The optimal surgical approach for patients with cervical myelopathy (DCM) remains a subject of ongoing debate. This systematic review and meta-analysis aimed to compare the effectiveness of anterior and posterior surgical approaches for patients with DCM, stratified by the number of affected levels and with a separate analysis for cases complicated by ossification of the posterior longitudinal ligament (OPLL). Methods: A comprehensive electronic search was conducted in databases, including Medline, EMBASE, Scopus, and Web of Science, up to June 12, 2023. The inclusion criteria comprised studies with patients diagnosed with degenerative cervical myelopathy and interventions that included anterior decompression or discectomy with or without fusion, laminoplasty, laminectomy with or without instrumentation. The evaluated outcomes included surgical results related to neurological, patient-reported, and radiological aspects, as well as the incidence of complications. Data extraction was meticulously carried out using a predefined electronic form. The Risk of Bias 2 (RoB 2) tool was employed to assess the risk of bias in randomized studies, while ROBINS-I was used for non-randomized studies. To compare outcomes between the anterior and posterior approaches, the Standard Mean Difference (SMD) was utilized. A meta-analysis was conducted to assess outcomes related to dysphagia, C5

palsy, modified Japanese Orthopedic Association (mJOA), and Neck Disability Index (NDI) using Stata version 14.0 (Stata Corp, College Station, TX) with a random-effects model at a 95% confidence interval. Further subgroup analyses were performed for DCM and OPLL groups based on the number of levels involved. Results: A total of 7,294 articles were screened, with 48 studies meeting the inclusion criteria. The assessment identified methodological concerns in 3 studies using RoB 2 and in 14 studies using ROBINS-I. The meta-analysis revealed a significantly higher prevalence of dysphagia in patients who underwent the anterior approach (OR = 13.30, 95% CI = 6.10 to 28.90). Conversely, C5 palsy occurred more frequently in patients subjected to the posterior approach (OR = 3.19, 95% CI = 0.90 to 11.36). Neurological function, as measured by mJOA, showed no significant difference (SMD = 1.62, 95% CI = -0.58 to 3.82). Furthermore, NDI improvement was more pronounced in cases where the posterior approach was employed (SMD = 1.93, 95% CI = 0.34 to 3.51). For OPLL groups with one or two levels involved, the SMD of mJOA was 0.26 (CI = -0.10 to 0.63), and for those with three or more levels, it was 0.06 (CI = -0.09 to 0.21). Conclusions: The choice of surgical approach did not significantly impact neurological function or recovery, but it was associated with a greater improvement in NDI for the posterior approach. Notably, dysphagia was more prevalent in patients who underwent the anterior approach. These findings provide valuable insights into the decision-making process for surgical interventions in cases of cervical myelopathy.

Keywords : Spinal Cord Diseases, Surgery, Systematic review, Meta-analysis, Degenerative Cervical Myelopathy, Ossification of Posterior Longitudinal Ligament

Count: 284
Abstract ID: 156
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Selegiline ameliorates spatial memory impairment in a rat model of Alzheimer's disease: The role of hippocampal synaptic plasticity and oxidative stress.

Submission Author: Hamid Shokati Basir

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Background and Aim : Alzheimer's disease (AD) is a progressive neurological disorder and the main cause of cognitive decline, affecting mental capacity and cognitive function. The present study was designed to investigate the precise effects of selegiline (SEL) on spatial memory performance and the role of synaptic plasticity in the hippocampus and oxidative stress in an AD rat model induced by unilateral intracerebroventricular (ICV) injection of amyloid beta (Aβ).

Methods : LTP induction and spatial memory were assessed in selegiline-treated rats (5 mg/kg/day). Moreover, serum levels of oxidative stress biomarkers, total oxidant status (TOS), total antioxidant capacity (TAC), and malondialdehyde (MDA). Furthermore, the number of healthy cells and deposition of Aβ plaques in rat's brains were evaluated.

Results : The results showed that AD-induced A? impaired spatial memory, which was paralleled by a reduction in fEPSPs slope, and PS amplitude. In addition, TAC content decreased, and TOS level and MDA level increased, which was associated with increased neuronal death and formation of A? plaques in rats. In contrast, selegiline treatment ameliorated spatial memory dysfunction, improved hippocampal LTP impairment, modulated oxidative-antioxidative status, and hindered A? plaques production and neuronal death in AD rats.

Conclusion : This data provides evidence that selegiline alleviates Aβ-induced cognitive deficit, probably by amelioration of hippocampal LTP impairment, modulation of oxidative-antioxidative status, and inhibition of Aβ plaque accumulation and neuronal death.

Keywords : Alzheimer's disease, selegiline, spatial memory, Long-term potentiation Oxidative stress

Count: 285
Abstract ID: 64
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Does Nicotine from Passive Smoking and Foods Protect against Parkinson's disease?

Submission Author: Arezoo Fathalizadeh

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Background and Aim : There is generally a strong link between smoking, more particularly, passive smoking, and the occurrence of various illnesses and health-related disorders. Also, there is a globally recognized epidemiological link between smoking and PD. However, the current data on passive smoking are contradictory. Thus, this paper extracted the inconsistent existing studies to systematically shed light on the slightly ambiguous protective properties of dietary nicotine and passive smoking as an influential factor against PD.

Methods : -This systematic review was registered in PROSPERO (CRD042020160707). Two independent researchers searched through the following databases: PubMed, Cochrane Library, Scopus, Ovid, Embase, Google Scholar, and ProQuest to find relevant dissertations and theses. This paper involved the data of papers published until 30 September 2020. The paper used the Newcastle-Ottawa scale (NOS) for case-control and cohort studies for quality assessment. The study extracted cases without a history of smoking and the number of patients with PD in the workspace, home, and lifetime and organized them based on each research. The study implemented Q-statistic to investigate the selected papers based on statistical heterogeneity, including four cohorts and five case-control papers in total.

Results : This paper revealed the slightly improving (protective) effect of long-time exposure to smoking on PD risks (OR:0.84; 95% CI: 0.70-0.99; p=0.04). The settings, workspace, home exposure, and PD risk did not display to have any considerable relationship. It should be noted that the papers on the relationship between dietary nicotine and PD risks have revealed the protective effect of nicotine-rich foods like potatoes, tomatoes, and peppers on PD risks.

Conclusion : In light of the observational studies covered in this paper, its findings should receive an organized interpretation while identifying the relevant mechanisms of this association.

Keywords : Parkinson's disease; passive smoking; home exposure; work exposure; lifetime exposure; systematic review

Count: 286
Abstract ID: 46
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

An umbrella review of systematic reviews with meta-analysis on the role of vitamins in Parkinson's disease

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Background and Aim : Despite the fact that several researches on the association between vitamins and Parkinson's disease (PD) have been undertaken, the findings are inconsistent and sometimes contradictory, making it impossible to draw a firm conclusion about the exact relationship between different vitamins and PD based on all available evidence. Also, deep assessment of the previously conducted meta-analyses reveals that in many of the previous studies, there are important methodological issues taking the heterogeneity of the included studies into account, making it difficult to rely on their results. Thus, this umbrella review aimed to conduct a systematic review of the available literature and assess the association between dietary intake or serum levels of various vitamins and the risk of PD, utilizing meta-analytic techniques to aid in the development of more effective treatments for PD patients who are vitamin deficient.

Methods : Pubmed/Medline, Scopus, Google Scholar and hand searching bibliographies of retrieved articles in duplicate, were used to detect all relevant meta-analyses using the specific search algorithm with the keywords ''Parkinson's disease'', ''PD'', "Parkinson disease" and "vitamin*", from inception to 10 February 2022 (last update). After study selection, data were extracted from previously published meta-analyses and pooled by Review Manager version 5.4 and CMA software version 2.2.064 to achieve effect sizes. Level of statistical significance was set at $P \leq 0.05$. Finally, we performed meta-analyses for each vitamin type based on the effect sizes,

number of instances, and total number of participants reported in the component studies included in the meta-analyses. To study diffusion bias, funnel diagrams and the Begg test were utilized.

Results : A total of 126 publications were identified in six databases, and 91 publications were obtained after excluding duplicates. Fourteen published meta-analyses were obtained after full-text screening. From the included meta-analyses, 6 articles were conducted with measurements based on dietary intake, 10 had conducted analysis with measurement of plasma vitamin levels, and 2 had included articles with measurements of sun exposure. Serum vitamin D and B12 levels were significantly lower in PD (SMD?=??0.67 and SMD?=??0.40 respectively). Homocysteine (Hcy) levels were significantly higher in PD patients (SMD?=?1.26). Also the odds ratio for highest vs. lowest vitamin E intake was 0.73 which was significant. However, there was no significant difference between vitamin A, C and B6 intake or serum levels in PD vs. control groups.

Conclusion : Our investigation discovered that PD patients had much lower blood vitamin D and B12 levels than healthy persons, whereas their Hcy levels were significantly greater. Additionally, increased vitamin E consumption was related with a considerably decreased chance of developing Parkinson's disease when compared to lower vitamin E consumption. There was, however, no significant association between increased vitamin A, C, and B6 consumption or blood folate levels with risk of PD. However, there are still certain gaps in our understanding of the function of certain vitamins, such as vitamin A compounds, vitamin C, vitamin B6, Hcy, and folate, in Parkinson's disease and in patients' motor or cognitive performance.

Keywords : Parkinson's disease; vitamins; antioxidants; meta-analysis

Count: 287
Abstract ID: 34
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Neuroprotective effects of coenzyme Q10 on neurological diseases: a review article

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Background and Aim : Neurological disorders affect the nervous system. Biochemical, structural, or electrical abnormalities in the spinal cord, brain, or other nerves lead to different symptoms, including muscle weakness, paralysis, poor coordination, seizures, loss of sensation, and pain. There are many recognized neurological diseases, like epilepsy, Alzheimer's disease (AD), Parkinson's disease (PD), multiple sclerosis (MS), stroke, autosomal recessive cerebellar ataxia 2 (ARCA2), Leber's hereditary optic neuropathy (LHON), and spinocerebellar ataxia autosomal recessive 9 (SCAR9). Different agents, such as coenzyme Q10 (CoQ10), exert neuroprotective effects against neuronal damage.

Methods : Online databases, such as Scopus, Google Scholar, Web of Science, and PubMed/MEDLINE were systematically searched until December 2020 using keywords, including review, neurological disorders, and CoQ10.

Results : CoQ10 is endogenously produced in the body and also can be found in supplements or foods. CoQ10 has antioxidant and anti-inflammatory effects and plays a role in energy production and mitochondria stabilization, which are mechanisms, by which CoQ10 exerts its neuroprotective effects.

Conclusion : Thus, in this review, we discussed the association between CoQ10 and neurological diseases, including AD, depression, MS, epilepsy, PD, LHON, ARCA2, SCAR9, and stroke. In addition, new therapeutic targets were introduced for the next drug discoveries.

Keywords : Alzheimer’s disease, depression, epilepsy, Parkinson’s disease, neurological disorder

Count: 288
Abstract ID: 320
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

A review and perspective on iron chelation therapy for the treatment of Alzheimer's disease

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Introduction: Alzheimer's disease (AD), a neurodegenerative condition, is defined by neurofibrillary tangles, amyloid plaques, and gradual cognitive decline. Regardless of the advances in understanding AD's pathogenesis and progression, its causes are still contested, and there are currently no efficient therapies for the illness. Iron is essential for several cellular processes, such as neurotransmitter synthesis, cell growth, mitochondrial oxidation, and metabolism. However, the imbalance in iron input and its preservation and outflow causes the accumulation of iron and increases the susceptibility of cells to ferroptotic cell death and neurodegeneration. In recent years, extensive research has conducted on disturbed iron metabolism pathway in relation to AD. This study decided to review the involvement of disruption of brain iron homeostasis in AD pathogenesis, with a focus on the possible efficacy of iron chelators, which exert a range of neuroprotective effects. Methods: The databases Science Direct, Google Scholar, PubMed, and Scopus were searched using relevant keywords such as "iron", "ferroportin", "transferrin receptor 1", "ferritin", and "Alzheimer's disease" and relevant studies were retrieved from 2010–2023. Results: Increased iron levels and their co-localization with neurofibrillary tangles and amyloid beta (Aβ) plaques in the hippocampus, parietal cortex, and motor cortex of AD brains have been reported by several studies. Along with the iron dysregulation, downregulation of ferroportin, a key iron exporter, and upregulation of transferrin receptor 1, the main iron transporter into cells, were observed in AD brain tissues. Moreover, a significant increase in CSF ferritin in AD individuals compared to controls was detected. Even though the precise mechanisms of iron dysregulation in AD pathogenesis are currently unclear, new data indicates that iron buildup

contributes to the pathophysiology of tau and Aβ in AD and is highly correlated with the rate of neurodegeneration and the extent of memory loss in AD patients. According to new preclinical and clinical research, deferoxamine, deferiprone, deferasirox, and α-lipoic acid (LA) are iron chelators that show promise as an AD therapy. The findings of the studies revealed that iron chelation therapy decreased APP protein expression, Aβ load, tau phosphorylation, oxidative stress, neuroinflammation, and ferroptotic cell death, and then markedly improved memory performance in AD. Conclusions: A disturbed iron metabolism plays a role in the pathogenesis of AD. Thus, an emerging approach in the therapy of AD-related neurodegeneration is the development of novel iron chelators that act as neuroprotective agents.

Keywords : Alzheimer's disease; Iron homeostasis; Memory; Neurodegeneration; Iron chelators

Count: 289
Abstract ID: 516
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Effects of gut microbiota on nervous system defects

Submission Author: Zahra Jokar

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Neurodegenerative diseases are caused by the dysfunction of neurons and their slow and progressive loss. Parkinson's disease and Alzheimer's disease are the most important neurological diseases. With increasing age, the prevalence and occurrence of these diseases increases sharply. Psychiatric disorders such as anxiety, depression and addiction are also neurological problems that require new treatment solutions. Today, the role of the gut microbiome in the pathogenesis of nervous system diseases has been intensively studied. Studies show that the brain and gut microbiome are connected through the gut-brain axis, a complex network of neurons, proteins, and chemicals that relay messages between the gastrointestinal tract and the brain. In an experimental model of Parkinson's disease, it has been shown that changes in gut microbiota caused by antibiotics reduce inflammation, prevent the loss of dopamine neurons in the striatum, and improve movement disorders. Changes in the gut microbiota may affect the synthesis of some key molecules beneficial to the brain, such as dopamine, and thus directly affect cognitive decline in Alzheimer's disease. Increasing evidence shows that intestinal microbiota dysfunction is involved in the early stages of Alzheimer's disease, immune system aging, neuroinflammation, cytokine secretion, and oxidative stress. Germ-free animals show more stress-related anxiety, and administration of probiotics reduces anxiety-like behaviors, improves cognitive function, and restores BDNF levels in the hippocampus to normal. Correlations have been shown between microbiome changes and addiction, as well as disorders commonly associated with addiction, such as anxiety, depression, pain, and stress. Opioid receptors are highly expressed in the gastrointestinal tract. Many studies show that the use of opioids changes the composition of the

microbiota. Intermittent but not sustained treatment with morphine has been shown to induce microglial activation, hyperalgesia and impaired reward response. These results suggest that different opioid treatments affect the gut microbiome in unique ways, which are causally related to behaviors associated with opioid addiction. Many studies also examine the microbiome as a potential therapeutic target for morphine withdrawal. Based on the results of these findings, it can be concluded that studying the effect of intestinal microbiota on the brain through the gut-brain axis can be a useful and effective way to investigate the factors involved in the development of neurological diseases. Further studies in this field could provide a serious solution for the treatment of these diseases.

Keywords : Intestinal microbiota; Neurodegenerative diseases; Stress; Addiction; Anxiety

Count: 290
Abstract ID: 626
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

the effect of transplantation of motor neuron-like cells differentiated from adipose-derived stem cells on sperm parameters and testicular histology in spinal cord injured rats.

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Background and Aim : Spinal cord injury (SCI) is one of the most important and serious consequences of traumatic injuries such as accidents, sports injuries, falls, and neurodegenerative diseases. In addition to the impact on lifestyle and psychological, economic, and social problems, SCI causes an increase in infertility in men, which is one of the most important injuries of spinal cord injuries in men . One of considerable methods to the regeneration and repair of the nerve in the field of neuroscience and neurology are through motor neuron-like cells, the easiest source of obtaining these cells is the adipose-derived stem cells, which have unique characteristics.

Methods : Mesenchymal stem cells derived from the adipose tissue. After culture, its mesenchymal stem identity was confirmed by differentiation into fat, bone, and flow cytometry. Fat cells were differentiated into motor neuron-like cells in the differentiation medium and Neuronal Nuclear antigen (NeuN) and SOX2 markers were determined. 60 adult male Wistar rats with an average weight of 230-250 g were randomly divided into 10 groups: 1-Intact, 2-Sham, 3-SCI, 4-vehicle, 5-Conditioned medium (CM), 6- Conditioned medium plus (CM+), 7- Adipose-derived Stem cells (ADSCs), 8-ADSCs +CM, 9-Motor Neuron-like Cells (Diff),10-Diff+CM+. The animals were subjected to SCI after anesthesia. Depending on the type of group, cells or conditioned medium were injected. 8 weeks of BBB, Hotplate, Tail flick, and Footprint behavioral tests were performed. The rats were sacrificed and sperm parameters were checked. The spinal cord and testes were fixed in 10% formalin, section, staining, and analyzed.

Results : ADSCs were differentiated into Diff. Lesion repair in tissue sections of the spinal cord, improvement of behavioral tests, sperm parameters, and testicular histology, and Johnson's criteria were significantly better in the Diff group (group 9) compared to other treated and untreated groups. Further investigations are needed.

Conclusion : The results of this study suggest that transplanting Diff to the spinal cord injured rats can improve motor skill disorders, testicular tissue structure, and sperm parameters caused by acute spinal cord injury to some extent .

Keywords : Spinal cord injury, Sperm parameters, Testis histology, Motor neuron-like stem cells

Count: 291
Abstract ID: 20
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Effects of intra cerebro ventricular norepinephrine injection on spatial memory by using Moris Water Maze in the model of sporadic Alzheimer's

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Background and Aim : With considering the importance of chronic stress as one of the most important factors in the occurrence and exacerbation of Alzheimer's disease,in search of the role of stress axes including the sympathetic axis or the hypothalamus-pituitary-adrenal axis in their effects in the exacerbation of Alzheimer's disease,in this research by imitating the sympathetic axis of stress, the effects of norepinephrine(NE) prescription in the central nervous system on spatial memory and in the sporadic Alzheimer's model has been investigated.

Methods : The present study was conducted experimentally on 49 male Wistar rats. Animals were randomly divided into 7 groups: 1-month-old and 3-month-old control group, 1-month-old and 3-month-old sham group, single-dose streptozotocin (STZ) group (0.5mg/kg) in 3-month-old, NE group for two weeks in 1-month-old (30 µg daily), two-week NE group in 3-month-old (50 µg daily), two-week NE group at 1 month and a single dose of STZ (0.5mg/kg) at 3 months, single dose group of STZ (0.5mg/kg) and then two weeks of NE in 3-month-old. All prescriptions were done intra cerebro ventricular (i.c.v) one week after recovery from surgery and cannulation. In order to evaluate the cognitive changes, especially in the field of learning and spatial memory in pseudo-Alzheimer's induced by STZ and also to investigate the effects of NE on it, 3 months after the last injection, the Morris water maze method was used.

Results : Single dose injection of STZ at 3 months reduces learning and recall ($p < 0.05$). The group that received NE daily for 2 weeks at 3 months and the group that received NE daily for 2 weeks at 1 month showed a decrease in learning and recall speed ($p < 0.05$,$p < 0.01$,$p< 0.001$). Single dose injection of STZ at 3 months of age followed by daily injection of NE showed that the

process of learning and recall is reduced ($p < 0.05$,$p < 0.01$). Daily injection of NE at 1 month and single dose injection of STZ at 3 months reduced learning and recall ($p < 0.05$,$p < 0.01$,$p< 0.001$).

Conclusion : increasing the level of NE in the central nervous system by i.c.v injection in healthy adult male rats, that imitates the sympathetic branch of stress,brings destructive effects in the process of learning and remembering, and the speed of this process reduces and disrupts spatial memory; It seems that the symptoms of this disorder are similar to the symptoms of cognitive impairment caused by STZ. Perhaps long-term stimulation by NE causes long-term excitotoxicity and chronic neuroinflammation and then cognitive impairment in healthy rats. The increase of norepinephrine level in the central nervous system did not show much strengthening effects in the cognitive impairment of the Alzheimer's model caused by STZ, maybe in the mice that have the cognitive impairment caused by STZ neuroinflammation,the inflammatory state is in a state of saturation automatically,so that norepinephrine cannot go beyond it and cannot show the strengthening effect in cognitive disorder.

Keywords : Sporadic Alzheimer's,Morris water maze,norepinephrine,spatial memory,chronic stress

Count: 292
Abstract ID: 43
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Exosomes as a nanotherapeutic agent for Alzheimer's and Parkinson's Disease treatment

Submission Author: Leila Hosseini

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Background and Aim : The significant rise in the global incidence of neurological diseases, such as Alzheimer's disease (AD) and Parkinson's disease (PD), is attributed to the aging population. There are no efficient therapies for these disorders, regardless of medical improvements. Hence, there is an urgent need for new treatments for these diseases. Exosomes are nanometer-sized membrane-bound extracellular vesicles secreted by different cell types cells for intercellular communication and can be detected in biological fluids in pathological and physiological contexts. They are found in numerous biological fluids, including serum, saliva, breast milk, serum, cerebrospinal fluid, etc. Exosomes carry cargo molecules from their cell of origin including proteins, mRNAs, microRNA, and lipids, and are delivered to the surrounding cells or carried to the distal cells.

Methods : PubMed, Google Scholar, and Scopus databases were searched to recognize publications from peer-reviewed journals using several keywords and their MeSH terms, including 'exosome', 'Alzheimer's disease', and 'Parkinson's disease'. The search was conducted on April 1, 2023, and no search filters on publication type. In addition, we selected studies that were written in English. Reference lists of all relevant publications were manually selected to identify advanced qualified studies.

Results : Exosomes attracted great interest as therapeutic players in AD and PD. These vesicles decreased ?-amyloid pathology and apoptosis of neuronal cells. Moreover, they reduced the

degeneration of dopaminergic neurons and ?-syn pathology and improved motor function in PD animals.

Conclusion : We summarized the various mechanisms of exosomes in the treatment of PD and AD. These vesicles can be of efficient medicinal value for aged-associated disease therapy in preclinical. Further clinical trials are needed, but the majority of the literature suggests research directions that may provide new treatment approaches and strategies for clinical application

Keywords : Exosomes; Neurodegenerative disorders; Treatment

Count: 293
Abstract ID: 3
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Autophagic Molecular Alterations in the Mouse Cerebellum Experimental Autoimmune Encephalomyelitis Model Following treatment with Cannabidiol and Fluoxetine

Submission Author: Maryam Akhavan

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Background and Aim : The crosstalk between Autophagy and Apoptosis is one of the most important processes involved in the cell program death and several mechanisms including oligodendrocytes apoptosis and autophagy play significant roles in activating macrophages, microglial cells, and finally demyelination in neurodegenerative disease. The antidepressants and anti-apoptotic mechanisms of Fluoxetine (FLX) and Cannabidiol (CBD) commence an autophagic event that can effectively repair myelin. This study aimed to investigate the effect of those reagents on the rate of demyelination in the cerebellum, an important site for white matter in a mouse model of experimental autoimmune encephalomyelitis (EAE).

Methods : Thirty adult female C57BL/6 mice were inducted EAE model, FLX treatment was performed (10 mg/kg/IP) & CBD were treated (5 mg/kg/IP), and their cerebellum was used for Western blotting, Real-time PCR to autophagic markers of LC3II, Beclin-1, and apoptotic markers Bax and Bcl2 evaluation and Luxol Fast Blue staining to the assessment of demyelination.

Results : The level of autophagic markers was expressively elevated ($P<0.01$) but the pro-apoptotic markers and Bax/Bcl2 ratio were reduced ($P<0.05$). Luxol Fast Blue (LFB) staining confirmed the noteworthy diminution of demyelination in treatment groups $P<0.001$).

Conclusion : This finding clarified that FLX and CBD ameliorate the severity of the EAE model. Combinatory treatments of these two agents are suggested for future investigations.

Keywords : EAE, Cannabidiol, Fluoxetine, Cerebellum, Autophagy, Apoptosis

Count: 294
Abstract ID: 18
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Review of unraveling the Hidden Connections: Exploring Cellular Junction Dynamics and Macromolecules in the Hippocampus for Novel Insights into Alzheimer's disease

Submission Author: Leila Chodari

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Background and Aim : Alzheimer's disease (AD) is a prevalent neurodegenerative disorder characterized by progressive neuronal damage and cognitive decline. Recent studies have shed light on the involvement of not only the blood-brain barrier (BBB) dysfunction but also significant alterations in cellular junctions in AD pathogenesis. In this review article, we explore the role of the BBB and cellular junctions in AD pathology, with a specific focus on the hippocampus. The BBB acts as a crucial protective barrier between the bloodstream and the brain, maintaining brain homeostasis and regulating molecular transport. Preservation of BBB integrity relies on various junctions, including gap junctions formed by connexins, tight junctions composed of proteins such as claudins, occludin, and ZO-1, as well as adherence junctions involving molecules like vascular endothelial (VE) cadherin, Nectins, and Nectin-like molecules (Necls). Abnormalities in these junctions and junctional components contribute to impaired neuronal signaling and increased cerebrovascular permeability, which are closely associated with AD advancement. Alzheimer's disease (AD) is a prevalent neurodegenerative disorder characterized by progressive neuronal damage and cognitive decline. Recent studies have shed light on the involvement of not only the blood-brain barrier (BBB) dysfunction but also significant alterations in cellular junctions in AD pathogenesis. In this review article, we explore the role of the BBB and cellular junctions in AD pathology, with a specific focus on the hippocampus. The BBB acts as a crucial protective barrier between the bloodstream and the brain, maintaining brain homeostasis and regulating molecular transport. Preservation of BBB integrity relies on various junctions, including gap junctions formed by connexins, tight junctions composed of proteins such as claudins, occludin, and ZO-1, as well as adherence junctions involving molecules like vascular endothelial (VE) cadherin, Nectins, and Nectin-like molecules (Necls). Abnormalities in these junctions and junctional components contribute to impaired neuronal signaling and increased cerebrovascular permeability, which are closely associated with AD advancement. By elucidating the underlying molecular mechanisms governing BBB and cellular junction dysfunctions within the context of AD, this review offers valuable insights into the pathogenesis of AD and identifies potential therapeutic targets for intervention.

Conclusion : By elucidating the underlying molecular mechanisms governing BBB and cellular junction dysfunctions within the context of AD, this review offers valuable insights into the pathogenesis of AD and identifies potential therapeutic targets for intervention.

Keywords : Alzheimer's Disease, Macromolecule, Cellular Junction, BBB

Count: 295
Abstract ID: 159
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The effect of alpha-tocopherol serum levels on clinical manifestations in patients with multiple sclerosis

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Background: alpha-tocopherol is one the main chain breaker antioxidant which is recommended to have useful effects on clinical manifestations in multiple sclerosis (MS) patients. This investigation aims to determine the effect of this antioxidant vitamin in patients with MS, according to the clinical evidence. Methods: Based on Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines, This systematic literature review was performed. Experimental and observational studies were included in this systematic literature review if they reported at minimum one of the related clinical symptoms or laboratory findings in MS patients. In addition, unpublished publications, animal studies, review articles, case series, case reports, letters, commentaries excluded. Scopus, PubMed, Web of Science, EMBASE and Google Scholar databases were searched until June 02, 2023. Results: Of 464 records that were screened in the title/abstract stage, 8 studies were included in this systematic literature review. The sample sizes in the included studies vary between 29 and 120 Evidence showed the beneficial effects of VE on lipid peroxidation in peroxisomes and lysosomes and MS-related manifestations such as attack rate. Discussion: This systematic literature review pointed out the probable advantageous impacts of VE on clinical symptoms in patients living with MS. The main limitation of this study was the restricted number of included studies; therefore, multi-central large-scale experimental studies are recommended. Various assessments outcome assessments, and study designs prevented meta-analysis which was the other limitation.

Keywords : vitamin E; alpha-tocopherol; multiple sclerosis; systematic literature review

Count: 296
Abstract ID: 391
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Human adipose tissue derived stem cells effect CdK5 and P53 expression in the hippocampus of rat model of Alzheimer's disease

Submission Author: Reshad Rezapour

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Background and Aim : Adipose tissue-derived stem cells are able to differentiate into neural and glial cells that can be used to treat various neurological diseases such as Alzheimer's Disease (AD). The aim of this study was to investigate the effect of stem cells injection derived from human adipose tissue on Cdk5 and p35 expression in the hippocampus of male rat model of Alzheimer disease.

Methods : Stem cells were isolated from human abdominal adipose tissue. The cells cultured and processed for differentiation. Immunohistochemistry and qRT-PCR respectively used for identification of the cells and Cdk5 and p35 expression in the hippocampus.

Results : The results demonstrated that the mean mRNA levels of Cdk5 in the trial group increased significantly compared to the control group ($p<0.05$), whereas they decreased substantially in the stem cell group compared to the model ($p<0.01$). The mean mRNA levels associated with P35 decreased significantly in the Alzheimer's model group compared to the control group ($p<0.05$), while they increased significantly in the stem cell group compared to the model ($p<0.01$), and the immunohistochemical test revealed that Cdk5 levels increased significantly in the model group compared to the control group. In comparison to the control group, the expression of p35 is significantly reduced in the model group.

Conclusion : In conclusion, using human adipose tissue derived stem cells might be a good therapeutic approach for AD.

Keywords : Alzheimer's disease, stem cells, human adipose tissue, beta amyloid, Cdk5, p35

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subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Investigating the effects of silibinin loaded in pegylated niosomal carriers on the control of the inflammasome pathway in neurotoxicity induced by amyloid-beta in male Wistar rats

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Background and Aim : Alzheimer's disease is the most common cause of age-related dementia, and the accumulation of amyloid-beta (Aβ) plaques in the brain is one of the pathological characteristics of this disease. To date, no definitive treatment for Alzheimer's disease has been discovered, and the use of herbal medicines in this field is increasing. Silibinin, the main flavonoid of silymarin, obtained from the seeds of the plant, has antioxidant, anti-inflammatory, liver protection, anticancer and neuroprotective effects. Therefore, in this study, the effect of the pegylated niosomal form of silibinin on the control of the inflammasome pathway in male Alzheimer's model rats receiving amyloid-beta (Aβ) was investigated.

Methods : 40 Wistar rats were divided into 5 groups (8 each): 1. Control group, 2. Alzheimer's group, 3. Alzheimer's + PBS group, 4. Alzheimer's group + silibinin, 5. Alzheimer's group + pegylated nanosilibinin. After conducting behavioral tests, the hippocampal rats of each group were kept at -70°C to check gene expression levels. Cresyl violet staining and Congo red staining were performed to examine the histopathological changes of the hippocampus.

Results : : Based on the results of the present study, spatial memory and avoidance behavioral tests improved in the groups receiving pegylated nanosilibinin compared to the patient groups, and this difference was significant, so that there was no significant difference to the control group. By activating the NLRP3 inflammasome pathway, amyloid beta causes memory and learning disorders ($P<0.05$) and treatment with pegylated nanosilibinin was able to significantly reduce these changes ($P<0.05$). According to the results of real-time PCR, the expression level of caspase 1, IL1 ? NLRP3 genes in the groups treated with pegylated nanosilibinin is strongly reduced and has a significant difference with the patient groups ($P<0.05$). Histopathology studies showed that pegylated nanosilybinin can reduce amyloid plaques and decrease neuronal destruction and death in the groups receiving pegylated nanosilybinin compared to the patient groups

Conclusion : The memory and learning disorder caused by intraventricular injection of amyloid beta is due to the activation of the inflammatory pathway of the inflammasome and ultimately neuronal death, and pegylated nanosilibinin effectively improved memory and learning. This effect can be due to the anti-inflammatory compounds of silibinin and passing through the blood-brain barrier through the niosome carrier and increasing the half-life of the drug through polyethylene glycol as a result of its high absorption in the brain tissue

Keywords : silibinin, pegylated niosomal carriers, inflammasome, amyloid beta, alzheimer

Count: 298
Abstract ID: 194
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

"Assessing the Impact of Pegylated Niosomal Silibinin on Antioxidant Pathway Genes in Male Wistar Rats with Amyloid-Beta-Induced Neurotoxicity"

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Background and Aim : Alzheimer's disease, a leading cause of age-related dementia, is characterized by the accumulation of amyloid-beta (Aβ) plaques in the brain. While definitive Alzheimer's treatments remain elusive, herbal remedies are gaining traction. Silibinin, a key flavonoid derived from plant seeds and found in silymarin, possesses antioxidative, anti-inflammatory, liver-protective, anticancer, and neuroprotective properties. In this investigation, we studied the impact of pegylated niosomal silibinin on the regulation of antioxidant pathway gene expression in male rats afflicted with Alzheimer's and induced with amyloid-beta (Aβ).

Methods : Forty Wistar rats were divided into five groups, each consisting of eight rats: 1. Control, 2. Alzheimer's, 3. Alzheimer's + PBS, 4. Alzheimer's + Silibinin, and 5. Alzheimer's + Pegylated Niosomal Silibinin. Following behavioral tests, the hippocampal tissue of each group was preserved at -70°C for gene expression analysis. Cresyl violet and Congo red staining were employed for histopathological assessment of hippocampal changes.

Results : The findings of this study revealed notable enhancements in spatial memory and avoidance behavior in groups receiving pegylated niosomal silibinin compared to Alzheimer's-afflicted groups. This improvement was significant and approached the performance of the control group. Amyloid beta-induced oxidative stress is known to cause memory and learning impairments, and treatment with pegylated niosomal silibinin significantly mitigated these effects. Real-time PCR results indicated a significant upregulation of SOD, GPX, and CAT genes in the pegylated niosomal silibinin-treated groups, showing a marked difference from the Alzheimer's-afflicted groups. Histopathological examinations demonstrated a reduction in amyloid plaques and a decrease in neuronal damage and death in groups receiving pegylated niosomal silibinin in comparison to Alzheimer's-afflicted groups.

Conclusion : The memory and learning deficits resulting from amyloid beta intraventricular injection are linked to the activation of the oxidative stress pathway and consequent neuronal demise. Pegylated niosomal silibinin effectively enhanced memory and learning, potentially due to the antioxidant properties of silibinin and its capacity to cross the blood-brain barrier via niosome carriers, ultimately extending the drug's half-life through polyethylene glycol, which enhances brain tissue absorption.

Keywords : Amyloid-Beta, Antioxidant, silibinin, pegylated niosomal carriers, alzheimer

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Abstract ID: 32
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Neurochemical ameliorating of the hippocampus in dyslipidemic Alzheimer patients following Silymarin; a double-blind placebo-controlled randomized clinical trial

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Background and Aim : Amyloid beta (Aβ) production is a normal physiological process, and an imbalance in Aβ production/excretion rate is the basis of the plaque load increase in AD. Low density lipoprotein receptor-related protein 1 (LRP1) is involved in both central clearance of Aβ from the CNS and peripheral transport of Aβ toward visceral organs. In this study, the effect of silymarin combination compared to rosuvastatin and placebo on neurometabolites and serum levels of LRP1 and Aβ1-42 proteins, and lipid profile and cognitive tests of AD patients.

Methods : Thirty-six mild AD patients were divided into three groups (n=12) silymarin 140mg, placebo, and rosuvastatin 10mg by random allocation method and double-blind. Medications were administered 3 times a day for 6 months. MMSE and CDR clinical tests were performed by neurologist assessment and relevant questionnaires. Triglyceride (TG), high-density lipoprotein (HDL), total cholesterol (TC), and low-density lipoprotein (LDL) were measured using relevant kits and an autoanalyzer method. Aβ1-42 and LRP1 markers were measured with the respective ELISA kits. To quantify the metabolites of myoinositol (mI), creatine (Cr), N-acetyl-aspartate (NAA), and choline (Cho), a 1.5 Tesla MRI scanner with multi-voxel MRS capability was used. All parameters and markers were measured at the baseline and end of the intervention. The data was analyzed with SPSS software and a significance level of 0.05 was considered, and the graphs were drawn with GraphPad.

Results : The levels of LRP1 and Aβ1-42 in the silymarin group were significantly increased compared to the other groups (P<0.05). Although there was no statistical difference between the groups in the ΔMMSE score (P>0.05), the increase of 1.73 and 1.68 points rather than the MMSE base level, respectively, in the patients of the silymarin and rosuvastatin groups compared to the placebo group indicates clinical significance. There was an inverse relationship between TG and Aβ1-42 (ρ=-0.555 and P=0.001). There was a direct correlation between the level of Aβ1-42 and LRP1 (ρ=0.588 and P<0.001). NAA/mI in the silymarin group had a significant increase compared to both the placebo and rosuvastatin groups (p=0.002 and p=0.005, respectively). Right and left hippocampal mI/Cr had a direct relationship with serum TG level (ρ=0.603, p=0.003 and ρ=0.595, p=0.004, respectively). NAA/Cr of the right and left hippocampus was inversely related to TG (ρ=-0.511, P=0.0033, and ρ=-0.532, P=0.0021, respectively). NAA/Cr and NAA/mI of bilateral hippocampus had a direct relationship with HDL (p<0.05). An inverse correlation was observed between the Aβ1-42 marker and mI/Cr of the right and left hippocampus (ρ=-0.661, P=0.000 and ρ=-0.638, P=0.000, respectively).

Conclusion : Donepezil and silymarin improved lipid profile associated with increased amyloid clearance associated with LRP1 carrier, improved antioxidant enzymes, increased NAA/Cr, and decreased mI/Cr in AD patients. Measurement of lipid factors and oxidative stress markers may be a suitable method for monitoring this disease. Biomarker NAA/mI can be clinically important in examining AD pathology.

Keywords : Alzheimer's disease; amyloid-beta; neuroimaging; magnetic resonance spectroscopy.

Count: 300
Abstract ID: 70
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Palliative Care in Alzheimer's Disease: Medication Patterns and Behavioral Correlates from a Dual-Phase Study

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Background and Aim : In the challenging landscape of Alzheimer's Disease (AD) treatment, palliative care has emerged as a pivotal factor. This research, conducted in two stages, delves into the prevailing medication patterns and associated behavioral correlates of AD patients.

Methods : The foundation rested upon a comprehensive literature review, using databases like PubMed/Medline, Scopus, and Cochrane, with a focus on "palliative care" and its intersection with "Dementia" or "Alzheimer's disease." Following this, 47 patient files (from an initial 415) from Firoozgar Hospital were retrospectively studied, covering the period 1397-1399.

Results : This deep dive revealed intriguing statistics: a mean age of 75.66±8.265 years and an education duration averaging 8.15±4.859 years. The symptoms, predominantly self-reported, ranged from memory complaints (42.6%) to aggression (40.4%) and delusions (57.4%). When pivoting to pharmacotherapy, it was observed that 83.0% were on antidepressants, with only 61.7% on acetylcholinesterase inhibitors like donepezil - considered a standard for AD. In tandem, 34.0% were administered antipsychotics. Interestingly, herbal alternatives like ginkgo Biloba made a cameo at 10.6%.

Conclusion : The study's merit lies in its prospective design, addressing retrospective study limitations, and an extended five-year patient follow-up post-thesis defense. Notably, potential biases stemming from single-perspective histories and non-clinical pharmacist data recording were acknowledged. The findings illuminate the complex interplay of medication and behavioral manifestations in AD, heralding tailored palliative care strategies

Keywords : Palliative care, Alzheimer's Disease, pharmacotherapy, dementia, behavioral correlates

Count: 301
Abstract ID: 39
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Computational Linguistics Reveals Consistent Indicators of Alzheimer's Disease across English and Persian

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Background and Aim : In this comparative study, we aim to determine wether linguistic features predictive of Alzheimer's disease(AD) are specific to English or generalizable to other languages. The results will clarify whether the linguistic indicators of AD are tied to specific linguistic characteristics of English or arise from core cognitive deficiencies that are independent of language.

Methods : For the English cohort, we examined the language of 234 AD patients and 141 age-matched healthy controls from the Pitts Corpus. In addition, we collected language samples from 23 Persian-speaking AD patients and 23 age-matched healthy controls. In both cohorts, language samples were obtained through the description of a similar picture. We extracted part of speech taggings, lexical features, and dependency relations using a fully automated algorithm applicable to both languages.

Results : Binary logistic regressions on the resultant language features could predict AD patients with 83.3% accuracy in the English cohort and 97.7% in the Persian cohort. Crucially, we found a

large degree of overlap among the indicators of AD across English and Persian. The strongest predictor of AD in both languages was nonspecific referencing, as measured by a higher proportion of pronoun to noun than healthy speakers. Other predictors of AD common to both languages included the production of shorter sentences, shorter words, and a higher proportion of verbs in the past over the present tense.

Conclusion : The linguistic indicators of Alzheimer's disease displayed notable consistency across both English and Persian cohorts. Such commonality suggests that AD influences fundamental cognitive processes beyond surface linguistic variations.

Keywords : Alzheimer's Disease; Linguistic features; Language; Dementia

Count: 302
Abstract ID: 190
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Development and characterization of an intranasal thermosensitive nanohydrogel of rivastigmine

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Background and Aim : Intranasal administration of pharmaceutical compounds is gaining considerable attention as an alternative route for localized/systemic drug delivery. However, insufficient therapeutic efficacy of drugs via this route seems to be a major challenge for the development of de novo intranasal formulations. This shortcoming can be overcome by simultaneous utilization of a nanoparticulate delivery system with a polymeric hydrogel network.

Methods : The aim of the present study was to develop erodible in-situ hydrogel forming systems of poloxamer 407® (P407) as a promising platform, capable of prolonging rivastigmine release from the embedded poly(lactic-co-glycolic acid) (PLGA) nanoparticles (NPs). PLGA NPs containing rivastigmine were formulated and characterized, then were embedded in the hydrogel forming matrix and analyzed in terms of viscosity, stability, gelation temperature, loading efficiency, and mucoahesive behavior. The cytotoxicity of NPs was evaluated on A549 cell line using MTT assay. The cellular uptake of NPs was also measured by means of fluorescence microcopy and flow cytometry analyses. The formulations were finally evaluated for their permeability across the sheep nasal mucosa.

Results : A linear dependence of sol-gel temperature (Tsol-gel) on the P407 concentration was observed, and a P407 content of 18% was selected. The loading efficiencies of formulations were found to be around 100.22–104.31%. The rivastigmine-loaded NPs showed a suitable cytocompatibility on A549 cells with a time-dependent increase in cellular uptake. Besides, nanohydrogels showed higher amounts of drug permeation through the sheep nasal mucosa than plain drug nanohydrogel.

Conclusion : It is concluded that the formulated nanohydrogel can be considered as a potent drug delivery system for the nasal delivery of rivastigmine.

Keywords : Rivastigmine; hydrogel; intranasal delivery; PLGA; nanoparticles

Count: 303
Abstract ID: 284
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

The Effects of Cannabidiol-Based Treatments on Alzheimer's Disease: A Focus on Inflammatory Factors. A Systematic Review

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Background and Aim : Alzheimer's Disease (AD) remains an enigmatic and challenging neurodegenerative condition with limited therapeutic options. Growing evidence suggests that neuroinflammation plays a pivotal role in AD pathogenesis, and modulating inflammatory factors could offer promising avenues for treatment. This review explores the potential effects of Cannabidiol (CBD)-based treatments on Alzheimer's disease, with a specific focus on their impact on inflammatory factors.

Methods : Keywords related to AD, Cannabidiol, and Inflammatory Factors were identified on MeSH and searched on PubMed and Google Scholar from 2006 until 2023. Our comprehensive examination of current research in the field encompasses both in vitro and in vivo studies investigating CBD's potential in AD.

Results : A total of 15 studies were identified based on the inclusion criteria. We analyzed the mechanisms through which CBD may mitigate neuroinflammation, including its effects on cytokines, microglial activation, and oxidative stress. The maximum and minimum CBD dosages in animal studies were 10 and 50 mg/kg, respectively.

Conclusion : Our findings establish the anti-inflammatory properties of CBD in experimental models of AD.

Keywords : Cannabidiol, Alzheimer's Disease, Inflammatory Factors

Count: 304
Abstract ID: 232
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Effect of hair follicle-derived stem cells (HFSCs) against memory impairment induced by intracerebroventricular administration of streptozotocin in male rats

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Background and Aim : Alzheimer's disease (AD) is one of the most prevalent neurodegenerative condition. AD patients typically experience a decline in short-term memory, which hampers their daily activities. This is later accompanied by impairments in other cognitive domains such as language, logical reasoning, executive function, behavior, and eventually motor skills. Although current pharmacological treatments offer limited effectiveness and only provide temporary relief from symptoms, there is hope in cell-replacement therapy utilizing stem cells as a potential breakthrough for AD. Hair follicle-derived stem cells (HFSCs) are remnants of the embryonic neural crest that migrate to the hair follicle and retain their ability to differentiate into various cell types throughout adulthood. Since HFSCs can be easily obtained and cultivated, they present themselves as ideal candidates for cell therapy in the treatment of AD. This study aimed to evaluate the protective effect of HFSCs against memory impairment induced by intracerebroventricular (icv) administration of streptozotocin (STZ) in rats.

Methods : Adult male Sprague-Dawley rats weighing 250−350 g were assigned into 3 groups including control group, STZ group, and STZ + HFSCs group. Rats were mounted into a stereotaxic frame, and according to Paxinos brain atlas, stainless steel guide canula were implanted unilaterally into lateral ventricle. Microinjection of STZ (3 mg/kg in divided doses/icv) was performed on days 1 and 3. Two million cells in 300 µl of PBS were injected into the tail vein of animals in the STZ + HFSC group on days 4, 14, and 21 after surgery. The passive avoidance test using shuttle box apparatus was done to assess memory on days 28 and 29 post surgery. Following behavioral study, the animals were decapitated and their hippocampi isolated and stored in −80 °C

for molecular study. The hippocampal mRNA expression of BDNF, TGFβ, GFAP, and VEGF was evaluated by quantitative RT-PCR.

Results : Our results showed that icv STZ induced significant memory deterioration compared to control group. However, HFSC therapy led to significant improvement in memory retention. Moreover icv-STZ resulted in upregulation of hippocampal BDNF, TGF?, and GFAP genes and downregulation of VEGF gene expression. Despite, HFSC therapy led to significant reduction of BDNF expression, there were no significant differences in expression of other genes.

Conclusion : The findings of this study provide evidence that the use of HFSC therapy effectively prevented memory decline. These results suggest that HFSCs have a neuroprotective effect and show promise as a potential treatment for AD. Given the similarities between icv-STZ induced memory impairment and sporadic AD, the stem cell therapy could be a new approach and valuable tool to treatment for dementia.

Keywords : Alzheimer’s disease; Stem cells; Streptozotocin; Memory

Count: 305
Abstract ID: 176
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Investigating the effects of N-acetylcysteine on memory impairment induced by ICV- streptozotocin rat model.

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Background and Aim : Streptozotocin (STZ) is a naturally occurring chemical that, when injected intracerebroventricularly (ICV-STZ), is known to induce cognitive and memory deficits. Decreased the levels of antioxidant indexes including GSH is considered to be a major outcome of oxidative damage induced by ICV-STZ. N-Acetylcysteine (NAC), a derivative of the amino acid L-cysteine, is widely recognized as the most extensively utilized antioxidant in both experimental and clinical studies. It exhibits neuroprotective properties and functions as a radical scavenger by replenishing GSH. The study intends to investigate whether N-acetylcysteine administration can mitigate the negative effects of streptozotocin, such as memory impairment and oxidative stress, by evaluating its potential neuroprotective and antioxidant properties.

Methods : In this study, 30 male Wistar rats weighing approximately 180-250 gr were obtained from the Pasteur Institute in Amol, Iran. The animals were divided into three control groups (distilled water orally), Saline (STZ) group (stereotaxic injection of 3 mg/kg of STZ and Saline orally) and NAC group (stereotaxic injection of 3 mg/kg of STZ and 50 mg/kg of NAC orally). After 21 days of treatment, passive avoidance memory test and GSH content measurement was performed.

Results : The results of the research show that the Saline (STZ) group had significantly ($P<0.001$) less delay to enter the dark area and spent more time in the dark area than the control group. Also, NAC at a dose of 50 mg/kg showed a similar result in this indexes compared to the control group. In addition, treatment with NAC showed a significant increase in the delay of entering the dark area ($P<0.01$) and a significant decrease in the time spent in the dark area ($P<0.001$) compared to the Saline (STZ) group. Statistical analysis indicated that the Saline (STZ) group significantly

decreased (P<0.01) the hippocampal GSH level compared with control group. NAC group significantly increased (P<0.05) the hippocampal GSH level compared with Saline (STZ) group.

Conclusion : The findings of the present study demonstrate that the administration of NAC at a dosage of 50 mg/kg leads to a significant improvement in memory decline. Also counteracts the oxidative stress by increasing the GSH content in an animal model of Alzheimer's disease.

Keywords : N-acetylcysteine; Memory deficits; GSH; Streptozotocin

Count: 306
Abstract ID: 646
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Brain insulin resistance in Alzheimer's disease

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Insulin can be transmitted across the blood brain barrier (BBB) by a saturated transport system. Moreover, insulin is produced in the brain. There is evidence to suggest that type 2 diabetes mellitus (T2DM) is associated with dementia. T2DM is a risk factor for Alzheimer's disease (AD). Preclinical studies have demonstrated the role of T2DM in AD pathology. Overlapping molecular mechanisms have also been suggested for these two diseases. Brain insulin resistance may be defined as the failure of the brain cells to respond to insulin. The name "Type 3 Diabetes" has been suggested for AD, proposing a role for impaired brain insulin resistance in AD. Here, we reviewed the literature related to brain insulin resistance in AD. A literature search of relevant studies was carried. Brain insulin resistance gives rise to brain glucose and insulin insufficiency, resulting in neural and cognitive impairments in AD. Brain glucose insufficiency can be reflected by the lower brain glucose metabolism seen in MCI and AD. Insulin resistance may disrupt the BBB and, in turn, its permeability. This can result in dysfunction in the cerebrovascular system, causing synaptic plasticity and cognition impairment. Insulin suppresses the amyloid beta (Aβ) formation. The beta secretase enzyme, which is overactivated by impaired insulin signaling, cleaves amyloid precursor protein leading to Aβ formation. Decreased responsiveness to insulin can occur at all levels of the insulin receptor-IRS1-P13K-Akt pathway. The formation of neurofibrillary tangles can arise from impaired insulin signaling. Impaired insulin signaling activates glycogen synthase kinase-3 beta, which hyperphosphorylates tau protein, leading to the formation of neurofibrillary tangles. Insulin suppresses the activity of proinflammatory proteins, which downregulates the inflammatory response. Insulin resistance promotes oxidative stress through several routes. Several insulin signaling-based therapies have been proposed for AD. Intranasal insulin administration improves memory in mild cognitive impairment or AD patients. Glucagon-like peptide analogues have been demonstrated to be neuroprotective in animal models of AD. To draw a conclusion, brain insulin resistance may be associated with AD through various mechanisms. Further basic and clinical studies are needed to elucidate the role of brain insulin resistance in AD.

Keywords : Alzheimer's Disease, Type 2 Diabetes Mellitus, Brain insulin resistance, Amyloid beta

Count: 307
Abstract ID: 428
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

The Renal-Neural Nexus: Unraveling the Link Between Chronic Kidney Disease and Cognitive Decline

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Background and Aim : -It has long been believed that kidney function is linked to brain activity. Clinical studies demonstrate that patients with chronic kidney disease (CKD) are more prone to cognitive impairment and Alzheimer's disease (AD), and the degree of cognitive impairment is closely related to CKD progression and renal failure.

Methods : -This review article was prepared based on the findings of the search in Web of Science, PubMed and Google Scholar databases from 2015 to 2022.

Results : -The risks of cognitive impairment in AD patients with CKD are significantly higher than those in patients without CKD not only in older CKD patients but also in young CKD patients (20–59 years old). These risks can be explained by two factors: vascular injury and the direct neurotoxicity of uremic toxins caused by CKD. There are many common characteristics between the pathogenesis of AD and that of CKD, including vascular dysfunction or degeneration, aging, hypertension, diabetes and hyperlipidemia. In addition, the expression level of APP in patients with kidney disease is higher, and a key protein, SorLA (sorting protein-related receptor), that regulates APP processing is simultaneously expressed in both kidney cells and neurons, and the gene's polymorphism is related to late-onset AD.

Conclusion : In summary, numerous epidemiological studies demonstrate that there is a high incidence of cognitive impairment or AD like dementia in CKD patients of all ages. This discovery highlights a new direction for the diagnosis and potential treatment of both CKD and AD. Vascular injury and the direct neurotoxicity of uremic toxins caused by renal dysfunction are the most reasonable mechanisms of the effects of CKD in AD patients. We might obtain unexpected results if we focus our attention on changes occurring in both the brain and the kidneys in further studies in the prevention and treatment of CKD and AD.

Keywords : chronic kidney disease (CKD); Alzheimer's disease (AD); cognitive impairment; kidney function; connection

Count: 308
Abstract ID: 543
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Minocycline improved learning and memory and attenuated oxidative stress and acetylcholinesterase activity in the brain in a rat model of amnesia induced by scopolamine

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Background and Aim : Minocycline as a tetracycline-derived antibiotic has been shown to have some beneficial effects in the central nervous system(CNS) including the neuroprotective effect. In the current study learning and memory improving effects of minocycline and its attenuating effects on oxidative stress and acetylcholinesterase(AChE) activity in the brain was investigated in a rat model of amnesia induced by scopolamine.

Methods : The rats were divided into 5 groups including: (1) Control, (2) Scopolamine, (3) Scopolamine + Minocycline 10, (4) Scopolamine + Minocycline 15 and (5) Scopolamine + Minocycline 30 groups. The rats of the groups 3-5 were given 10, 15 and 30 mg/ kg of the minocycline respectively, during 3 weeks. Scopolamine injection was done in the 2-5 groups at the third week 30 min before the Morris water maze (MWM) and passive avoidance (PA) tests. The rats were finally sacrificed, the brains were removed, and oxidative stress indicators (malondialdehyde (MDA) and thiol concentration and superoxide dismutase (SOD) activity) and AchE activity were measured.

Results : Intraperitoneal injection of scopolamine impaired performance of the rats in both MWM and PA tests. The rats of Scopolamine group had longer traveling time and distance to find the platform and spent shorter time and traveled shorter distance in the target area than the Control group in MWM test. The rats of scopolamine group also showed a shorter delay to enter the dark part and spent shorter time in the light part in PA test and they spent longer time in the dark part. A decrease in SOD activity and thiol content and an increase in MDA and AchE was seen in the brain tissue of Scopolamine group compared to the Control group. In the minocycline treated groups (10- 30 mg/ kg) a decrease in the traveling time and distance to reach the platform was seen in MWM. In MWM , all doses of minocycline also increased the time spent and the highest dose of minocycline improved the traveling distance in target area. In PA test, minocycline increased latency to enter the dark and total time spent in the light but decreased the time spent in the dark and number of entries into the dark. The biochemical data showed that minocycline decreased MDA concentration and AchE activity but increased SOD activity in the brain.

Conclusion : Our data showed that minocycline improved learning and memory and attenuated oxidative stress and acetylcholinesterase activity in the brain in a rat model of amnesia induced by scopolamine

Keywords : Acetylcholinesterase ;Scopolamine ;Minocycline ; learning ; Memory ;Oxidative stress

Count: 309
Abstract ID: 638
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

A systematic review of evaluating the effectiveness of non-invasive brain stimulation techniques on patients who have Alzheimer's disease(AD)

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Background and Aim : In patients who suffer from Alzheimer's disease (AD), non-invasive brain stimulation (NIBS) such as transcranial direct current stimulation (tDCS) or repetitive transcranial magnetic stimulation (rTMS) has been shown to improve brain function, according to recent studies. The aim of this study was to determine whether non-invasive brain stimulations may be used as an alternative kind of treatment for AD.

Methods : -Our team conducted a review of clinical trials of non-invasive brain stimulations in patients who suffer from Alzheimer, following PRISMA 2020 guidelines. We searched PubMed, WOS, and Scopus databases for English full-text papers until October 26, 2023, using comprehensive electronic search strategies. We extracted basic information from studies that met our inclusion and exclusion criteria, noting the number of studies, study type, study subjects, intervention and control group measures, outcome indicators, quality assessment tools, and main conclusions.

Results : -344 articles were acquired after eliminating duplicate articles from PubMed, Scopus, and Web of Science databases. After reviewing each of these publications separately, H.A. and R.R. chose 24 for full-text review. We used 5 of these research to synthesize the data. Two studies shown the beneficial benefits of transcranial magnetic stimulation (TMS) on the deceleration of Alzheimer's disease.Transcranial direct-current stimulation (tDCS) appears to be beneficial in three other cases, both in the short and long terms use.

Conclusion : Analyzing the data prove that AD patients can benefit from non-invasive brain stimulation techniques. It should be noted that, using NIBS by itself cant completely cure AD and needs to be paired with additional therapies.

Keywords : Alzheimer; Brain Stimulation; TMS; tDCS

Count: 310
Abstract ID: 248
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Mutant and wild α-synuclein changes learning and memory in cerebral hypoperfusion-induced vascular dementia in rats

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Background and Aim : Dementia occurs due to wide ranges of brain abnormalities, and lead to a progressive decrease in cognitive abilities. This type of dementia occurs as a result of blockage, rupture of cerebral vessels, cerebral ischemia, or hypoperfusion. The induction of the 2VO model causes a reduction of cerebral blood flow by 60-70%, and in this study, this model will be used to induce hypoperfusion. Alpha-synuclein accumulations are known as a key factor in the occurrence and spread of neurodegenerative diseases in the brain, and finding compounds that can inhibit their accumulations or toxicity is the focus of studies in the field of neurodegenerative diseases. As a result, the study aims to measure the effect of alpha-synuclein fibrillar, monomer, oligomer, and mutant types (A53T and A30P) on vascular dementia of the brain.

Methods : Rats were divided into seven groups. 1. Sham, an incision to the neck was conducted, and the carotid nerve was detached from the vagus nerve. 2. Control. CCAO (common carotid artery occlusion) was induced 3.CCAO+ monomer alpha-synuclein 4. CCAO+ oligomer alpha-synuclein 5.CCAO+ fibrilar alpha-synuclein 6.CCAO+ A53T alpha-synuclein 7.CCAO+ A30P alpha-synuclein. In each group, vascular dementia was induced by occluding the right and left common carotid arteries (2 vessels occlusion, 2VO), and then the animals were kept for one month. After that, all the treatment groups received 50 micrograms of alpha-synuclein intraperitoneally. Barnes maze test was used to investigate the cognitive performance of animals. Also, sensory-

motor and open field tests were performed in order to check the motor performance of animals on all animals in groups. On days 0,7,14,30 following injection, sensorimotor deficit evaluation was tested. On day 28, open field test was conducted. On days 22-30, the Barnes maze was conducted. On day 30, rats were anesthetized with ketamine(100mg/kg) and xylazine(10mg/kg), and they were sacrificed. The animals' brains were fixed in formalin for H and E staining.

Results : Examining the behavioral data shows that the fibrillar type has improved the movement, and memory states in ischemic rats. The oligomer type does not show a significant difference. The mutant types have also led to a decrease in the improvement of motor and memory status, in ischemic rats compared to the control group. Also, histological examination in H & E staining showed that number of viable cells in the fibrillar group are more than in the control and other groups. In the monomer and oligomer groups, an increase in viable cells was also seen compared to the control. In mutant types, a decrease in viable cells was observed, which is caused by cell damage.

Conclusion : The injection of different types of alpha-synuclein leads to balancing the effects of vascular dementia, as the injection of the fibrillar type leads to the reduction of cell damage.

Keywords : Alpha-synuclein; vascular-dementia; memory.

Count: 311
Abstract ID: 351
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Combination Therapy of Hair Follicle Stem Cells and Carbamylated Erythropoietin-Fc Improve Memory Impairment in a Rat Model of Chronic Cerebral Hypoperfusion

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Background and Aim : Dementia, which is characterized by chronic cerebral hypoperfusion (CCH) resulting from age-related microvascular damage or vascular risk factors, is closely associated with synaptic alterations in the brain. The lack of definitive treatments for dementia leads to significant psychological and economic challenges for patients' families and society as a whole. Current therapies for neurological disorders have not been able to effectively slow down disease progression or repair damaged brain areas. However, the carbamylated erythropoietin fusion protein (CEPO-Fc) has shown promising neurotrophic and synaptotrophic effects. Combining cell transplantation with other neurotrophic factors or medication therapy has been suggested as a potential strategy to enhance the efficacy of stem cells in treating neurological disorders. This study aimed to evaluate the effectiveness of combining hair follicle stem cells (HFSC) with CEPO-Fc in improving memory in rats with CCH.

Methods : A total of 64 adult male Sprague Dawley rats weighing between 230-250g were used in this study, which lasted for 6-8 weeks. During an initial 7-day adaptation period, the animals were handled daily to accustom them to the experimental conditions. After this period, the animals were divided into six groups: control, sham, CCH+vehicle, CCH+CEPO, CCH+HFSC, and CCH+HFSC+CEPO groups. Chronic cerebral hypoperfusion was induced by permanently ligating the common carotid arteries. CEPO-Fc was injected three times per week for a duration of 30 days. HFSC transplantation was performed on days 4, 14, and 21 after surgery. Spatial learning and memory were assessed using the Morris water maze (MWM) test. The basal synaptic transmission

(BST) and long-term plasticity (LTP) of rats were evaluated by recording field potentials in the CA1 region of hippocampus.

Results : In the MWM test, CCH rats showed significantly more time to find the hidden platform compared to the sham group. A significant recovery in the escape latency time was detected following treatment with HFSC and HFSC+CEPO-Fc. In addition, memory retention was significantly improves following combination therapy relative to the CCH+vehicle group. The results indicated the functional decline in BST in the CCH rats compared to the sham. Moreover, the percentage of LTP induction in the CCH rats was significantly lower than in the sham group. Following the combination therapy, both BST functioning and LTP showed significant improvement.

Conclusion : The findings of this study suggest that the combined administration of HFSC and CEPO-Fc may offer greater benefits compared to using CEPO-Fc or HFSC alone in treating memory disturbance in a CCH model, by promoting BST recovery. This type of combination therapy holds promise as a novel approach for the treatment of dementia.

Keywords : Hair follicle stem cells; Carbamylated erythropoietin; Chronic cerebral hypoperfusion; Memory

Count: 312
Abstract ID: 590
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

A Systematic Review of Transcranial Magnetic Stimulation for Enhancing Cognitive Function in Alzheimer's Disease Patients

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Background and Aim : Alzheimer's disease (AD) is a common neurodegenerative disorder that is defined by cognitive impairment and memory loss. The new technology called Transcranial Magnetic Stimulation (TMS) is a technique for the stimulation of different brain reign without any invasive procedure that has shown promise in the betterment of cognitive function(memory, attention,..) in AD patients

Methods : In this comprehensive review, we conducted a systematic search of databases including PubMed, Embase, and Cochrane Library databases to identify clinical trial studies which investigating the impact of TMS on cognitive function in AD patients. Our search strategy on PubMed was: (("transcranial magnetic stimulation"[MeSH Terms] OR "TMS"[Title/Abstract] OR "repetitive transcranial magnetic stimulation"[Title/Abstract]) AND ("Alzheimer Disease"[MeSH Terms] OR "Alzheimer's disease"[Title/Abstract])) AND ("cognitive function"[MeSH Terms] OR "memory"[Title/Abstract] OR "attention"[Title/Abstract] OR "executive function"[Title/Abstract] OR "language"[Title/Abstract] OR "perception"[Title/Abstract] OR "learning"[Title/Abstract]). We reviewed the literature on the mechanism of TMS and its potential therapeutic benefits for AD, discussed the available clinical trials investigating the effects of TMS on cognitive function in AD patients, and highlighted the potential mechanisms of action and concerns associated with TMS therapy

Results : Overall, our review suggests that TMS has the potential to boost cognitive function in AD patients. Specifically, our review found that TMS was related to significant improvements in cognitive function measured (e.g., memory, attention, executive function, etc). Our findings are like the previous research indicating the cognitive-enhancing effects of TMS in healthy individuals and other patient populations. The studies found that TMS over the left dorsolateral prefrontal cortex (DLPFC) could improve cognitive function specifically memory in patients with mild to

moderate AD. The cognitive outcome variables assessed included global cognition, memory, attention, and executive function. The basic component of cognitive-enhancing impacts with TMS in AD are not yet completely understood. However, several potential mechanisms have been proposed, including increased cortical excitability, enhanced synaptic plasticity, and improved neuronal connectivity. More research is needed to explain the specific mechanisms of action underlying the cognitive-enhancing effects of TMS in Alzheimer's disease

Conclusion : In conclusion, our systematic review provides evidence supporting the potential of TMS as a non-invasive therapeutic intervention for the betterment of cognitive function like memory in patients with Alzheimer's disease. However, further research is needed to illustrate the particular mechanisms of action underlying the cognitive-enhancing effects of TMS in Alzheimer's disease, and also to determine the optimal TMS parameters and treatment protocols for this patient population.

Keywords : Transcranial magnetic stimulation; Cognitive function; Non-invasive therapy; Alzheimer's disease

Count: 313
Abstract ID: 189
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

The role of vitamin D in the prevention and treatment of Alzheimer's disease: a Systematic review

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Introduction: Alzheimer's is an age-related neurodegenerative disease whose prevalence increases with age; According to the Alzheimer's World Health Report, it is estimated that there are currently more than 55 million Alzheimer's patients worldwide, and this number is expected to increase to 2.73 times by 2050. There are various vitamins with many benefits for preventing cognitive disorders, among them is vitamin D, which is a lipophilic sequestered that plays an important role in regulating the processes of phosphorus-calcium metabolism, the immune system, cell proliferation, and differentiation, and other vital functions in the body. Method: checking the PubMed database, and Google Scholar using the keywords "Vitamin D", "Alzheimer's" and "Treatment" and their meshes; All clinical trial articles that used vitamin D were included in the study. The electronic search was conducted in the period of 2011-2023. To carry out this review article, the 2009 PRISMA checklist was used, and articles that were conducted on animal samples, duplicate articles, articles with unclear statistical results, incomplete articles, and participants diagnosed with Alzheimer's or cognitive impairment were initially excluded. Also, only studies published in English were eligible for inclusion. Results: Finally, 15 studies were selected, the studies show that vitamin D has multiple functions throughout the central nervous system and can play a role in the prevention and treatment of disorders such as dementia, including Alzheimer's, and has a significant effect on the cognitive functions of the elderly who are being treated. It is a drug for dementia. Vitamin D deficiency (<20 ng/ml) in the weekly diet increases the risk of dementia and Alzheimer's in the elderly. Cognitive improvements have also been reported among older adults who took vitamin D supplements. Other studies indicated that long-term use of vitamin D and hypovitaminosis D can hurt improving dementia in the elderly. Conclusion: Using a supplement and maintaining a sufficient amount of vitamin D can be effective in the prevention and treatment of Alzheimer's, however, the evidence shows that high doses of vitamin D are dangerous for health and their dose should be adjusted, but long-term use of this Vitamin needs more reviews and studies.

Keywords : Alzheimer, vitamin D, Dementia

Count: 314
Abstract ID: 376
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The neuroprotective effects of Pinocembrin on the neurological scores, blood brain barrier permeability and brain edema after severe traumatic brain injury in male rat: A behavioral, biochemical and h

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Background and Aim : Traumatic brain injury is a worldwide health problem that has become a leading cause of death among young people in developed countries; In these countries, a large number of trauma patients suffer from chronic physical disability. Due to the effect of Pinocembrin on the improvement of brain injury, this study aimed to investigate the neuroprotective effects of Pinocembrin on neurological scores, blood-brain barrier health and cerebral edema, MMP-9 changes in CSF and histological changes following induction of severe brain trauma in male rats.

Methods : After induction of anesthesia and cannulation in the trachea, Wistar rats underwent diffuse controlled brain injury by Marrow method, and 30 minutes later, Pinocembrin was injected intraperitoneally in different doses. In the pre-traumatic times, immediately after recovery after trauma induction, 24, 48 and 72 hours after trauma, Veterinary Coma Scale and Beam Walk and Beam Balance tests were taken from the rats, as well as CSF collected for biochemical tests and the brain was fixed in 10% formalin and used for staining hematoxilin and eosin.

Results : The findings of this study show that brain injury due to controlled diffuse shock causes edema of brain tissue, destruction of the blood-brain barrier, changes in neurological scores and balance of the animal. Our findings also showed that Pinocembrin at doses of 25 mg/kg and 50 mg/kg could reduce these differences compared to the control group ($p < 0.001$). It should be noted that Pinocembrin was more effective at doses of 25 mg/kg.

Conclusion : this study showed that administration of Pinocembrin at doses of 25 mg/kg and 50 mg/kg improved neurological symptoms including improved motor function, improved blood-brain barrier status and cerebral edema in traumatized mice. Is. As a result, this drug can have protective effects on neurons and may also be effective in clinical cases of traumatic brain injury, which requires further study.

Keywords : Pinocembrin, brain trauma, blood-brain barrier, brain edema, rat

Count: 315
Abstract ID: 438
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The antineuroinflammation effect of amantadine on brain water content, blood brain barrier permeability and neurological scores after traumatic brain injury in male rats

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Background and Aim : Despite the recent advances in trauma research and the ongoing efforts of collaborative multidisciplinary studies to address this problem and improve patient recovery, traumatic brain injury (TBI) remains a global health burden and a public health challenge among all ages in all countries regardless of the patient's income level. Amantadine is an antiviral drug that is used for the prophylaxis and treatment of type A influenza, the treatment of Parkinson's disease, the treatment of drug-induced extrapyramidal reactions, and also for the reduction of fatigue associated with MS. In this research project, we investigated the neuroprotective role of amantadine in the process of diffuse concussion in rats, as well as its effect on the level of interleukins and histological changes.

Methods : After induction of anesthesia and cannulation in the trachea, 56 Wistar rats underwent diffuse controlled brain injury by Marmarou method, and 30 minutes later, the drug was injected intraperitoneally with different doses of Amantadine. In the pre-traumatic times, immediately after recovery from trauma induction, 24, 48 and 72 hours after trauma, Veterinary Coma Scale and Beam Walk and Beam Balance movement and balance tests were taken and recorded from rats. After 72 hours, CSF was collected from Cisterna Magna and used for ELISA test to evaluate the level of interleukins. Rats were killed under deep anesthesia and their brains were removed and fixed in 10% formalin for 48 hours. Staining with hematoxilin and eosin was used. Blood-brain barrier permeability was tested by Evans dye injection after induction of trauma in rats of the respective group.

Results : The findings of this study show that brain injury caused by controlled diffuse trauma causes cerebral edema, destruction of the blood-brain barrier, and disturbance in the animal's neurological and balance-motor scores (P<0.001). It also leads to an increase of interleukin 1 beta and a decrease of interleukin 10 in CSF fluid (P<0.001). Also, our findings showed that Amantadine dose-dependently in doses of 5 mg/kg and 10 mg/kg can reduce these differences compared to the control group (Sham and Intact) (p<0.001)). It should be noted that amantadine was more effective at a dose of 10 mg/kg (P<0.0001). At the dose of 20 mg/kg amantadine had no significant effects (P>0.05).

Conclusion : Based on this study, it can be seen that amantadine has anti-neuronal inflammatory effects in the brain and has been able to affect the consequences of concussion and reduce cerebral edema, accelerate the improvement of the blood-brain barrier and neurological and balance scores. Also, histological changes have been achieved in the direction of recovery, probably these effects of amantadine are through the reduction of inflammatory interleukins and the increase of anti-inflammatory interleukins.

Keywords : Amantadine; Neuroprotective; Brain trauma; Brain edema; Blood-brain barrier; Interleukins

Count: 316
Abstract ID: 526
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Establishing of animal model of Rat Optic nerve crush

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Background and Aim : Optic nerve injuries resulting from trauma to the facial and cranial areas have become a significant challenge for emergency and ophthalmology centers in Iran due to their high incidence. Studying such injuries is complex for several reasons, and managing chronic and progressive injuries requires precise rehabilitation. Investigating pathological changes is necessary to predict outcomes, but it is not feasible in human samples. Therefore, establishing a research center dedicated to this field is crucial, and developing a suitable optic nerve injury model in rats appears promising.
Methods : Rats were anesthetized and randomly divided into groups of 6 to 8 animals. Each rat underwent a procedure called lateral canthotomy, which involved exposing the optic nerve. A controlled pressure clamp was applied to the optic nerve, which was located 2 millimeters away from its head, for a duration of 30 seconds. After releasing the pressure and ensuring proper blood flow to the retina, the rat was returned to its cage. Three weeks later, using information from “Rat brain in Stereotaxic Coordinates” 7th edition on stereotaxic apparatus, the rat's skull was drilled to approach the superior Caliculus on both sides. The fluorescent tracer, DIA, was injected into the superior Caliculus on the right side at a specific depth. After one week, the rat was euthanized, and the eyes were removed. The optic nerves and posterior segments of the eyeballs were dissected for pathological examination and counting of ganglion cells under a fluorescence microscope.
Results : Through applying this method, we induced a chronic Optic nerve injury, through which, this study suggests an appropriate model for further research projects on chronic Optic nerve injuries.
Conclusion : Through applying this method, we induced a chronic Optic nerve injury, through which, this study suggests an appropriate model for further research projects on chronic Optic nerve injuries.
Keywords : Optic nerve crush, nerve trauma, optic nerve, retinal ganglion cell

Count: 317
Abstract ID: 448
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The neuroprotective effect of enoxaparin on the neurological scores, brain blood barrier and brain water content after severe traumatic brain injury in male rats: a behavioral, Biochemical and histolog

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Background and Aim : Head trauma is one of the leading causes of death under the age of 40 and accounts for a significant percentage of trauma deaths. Enoxaparin (ENX), in addition to anticoagulants, has many other pharmacological effects (e.g., reduction of intracellular Ca2 + release, antioxidant effect, anti-inflammatory or neurotrophic effects) that can have neuroprotective activity in neurodegenerative disease. Therefore, in this research project, we investigated the role of neuroprotective enoxaparin in the process of diffuse traumatic brain injury and also its effect on histological changes in male rats.

Methods : After induction of anesthesia and cannulation in the trachea, 60 Wistar rats underwent TBI, and 30 minutes later, enoxaparin was injected intraperitoneally in different doses. From the trauma, immediately after regaining consciousness after the induction, 24, 48 and 72 hours after the impact, Veterinary Coma Scale and Beam Walk and Beam Balance movement and balance tests were taken and recorded from rats. After 72 hours, CSF was collected and then the rats were killed under deep anesthesia, their brains were removed and fixed in 10% formalin for 48 hours and used for staining with hematoxilin and eosin. Blood-brain barrier permeability was tested by Evans dye injection after induction of concussion in rats of the respective group.

Results : The findings of this study show that brain injury due to controlled diffuse trauma causes cerebral edema, destruction of blood-brain barrier, disturbance of neurological and balance-motor scores of the animal and also causes perivascular edema, perinueral edema, astrocytes edema and Neurotic necrosis occurs (P <0.0001). Reduced inflammation (P <0.001). Our findings also

showed that enoxaparin at doses of 2 mg / kg and 4 mg / kg could reduce these differences compared to controls (Sham and Intact) ($p < 0.001$). . It should be noted that enoxaparin was more effective at a dose of 8 mg / kg ($P < 0.0001$).

Conclusion : Based on this study, it can be found that enoxaparin has neuroprotective effects in the brain and was able to affect the consequences of traumatic brain injury and reduce cerebral inflammation, cerebral edema, accelerate the improvement of blood-brain barrier status, neurological-balance scores and histological changes have been obtained for neuronal healing.

Keywords : Enoxaparin, Neuroprotective, Brain trauma, cerebral edema, Blood-brain barrier

Count: 318
Abstract ID: 177
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Neural Activity of Somatosensory Cortex Following Transplantation of Dental Pulp Stem into Right Lesioned-Barrel in Rats

Submission Author: Mansoureh Sabzalizadeh

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Background and Aim : Stem cells can improve the functional defects of brain injury. Rodents use their whiskers to get tactile information from their surroundings. Here, we examined whether the transplantation of stem cells into the lesioned barrel cortex can help neuronal function in the contralateral cortex.

Methods : : Sixteen male Wistar rats (200-230g) were used in this experimental study. We induced mechanical lesion in the right barrel cortex area of rats by removing this area by 3 mm skin punch. Four groups contain one intact group of rats 1- Control, and three lesion group 2- Lesion + un-differentiated dental pulp stem cells (U-DPSCs), 3- Lesion + differentiated dental pulp stem cells (D-DPSCs), 4- cell medium (vehicle) that were injected in the lesion area. Three weeks after transplantation of stem cells or cell medium, the rats' responses of left barrel cortical neurons to controlled deflections of right whiskers were recorded using by extracellular single-unit recordings technique.

Results : The results showed that the neural spontaneous activity and response magnitude of intact barrel cortex neurons in the lesion group decreased significantly ($P < 0.05$) compared to the control group while ON and OFF responses were improved in the D-DPSCs ($P < 0.001$) group compared to the vehicle group three weeks after transplantation.

Conclusion : Transplantation of dental pulp mesenchymal stem cells significantly improved the neural responses of the left barrel cortex that was depressed in vehicle group.

Keywords : Barrel cortex; Brain injury; Dental pulp stem cells; Electrophysiology, Rats.

Count: 319
Abstract ID: 339
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

The Neuroprotective Effect of Fucoxanthin on Water Content, Blood Brain Barrier and Neurological Scores after Traumatic Brain Injury in Male Rats: A Behavioral, Biochemical and Histological Study

Submission Author: ALi Siahposht khachaki

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Background and Aim : Severe brain trauma is the most important cause of death of young people all over the world, which imposes a lot of emotional, mental, physical and financial pressure on patients and the health system. Considering the neuroprotective effect of fucoxanthin on the recovery of brain damage, this study was conducted to investigate the effect of fucoxanthin on neurological scores, blood-brain barrier health, cerebral edema, and histological changes after the induction of traumatic brain injury in male rats.

Methods : In this experimental study, 64 adult male rats weighing 250-330 grams were assigned into 7 groups: 1- Intact, 2- Sham, 3- traumatic brain injury, 4- solvent group (DMSO), 5- Low dose of fucoxanthin (10 mg), 6- medium dose of fucoxanthin (20 mg), 7- high dose of fucoxanthin (40 mg). 6-8 heads were used in each group. 30 minutes after brain trauma, different doses of fucoxanthin were injected intraperitoneally by the Marmarou model. Neurological behavioral tests, brain edema and blood-brain barrier health were measured 3 days after brain trauma in all groups, and then the animal's brain was used for tissue staining.

Results : Neurological score, motor and balance scores in the beam task improved after the injection of 20 and 40 mg doses of fucoxanthin ($P<0.001$). Also, fucoxanthin in doses of 20 and 40 mg significantly reduced cerebral edema ($P<0.001$). Doses of 10 and 20 mg of fucoxanthin were effective on the health of the blood-brain barrier, while administration of this substance with a dose of 40 mg had no effect on the blood-brain barrier ($P<0.001$). In terms of histology,

fucoxanthin decreased perivascular edema, neuronal necrosis, and astrocyte edema. In most cases, the dose of 10 mg of fucoxanthin had no effect on the investigated cases ($P>0.05$).

Conclusion : According to the results, we believe that administration of fucoxanthin with variable doses can improve neurological symptoms, including improvement of motor and balance function, improvement of blood-brain barrier and cerebral edema and histophatological changes in rats. Thus, this substance can probably have protective effects on neurons after brain damage.

Keywords : Fucoxanthin; Traumatic Brain Injury; Cerebral Edema; Rat.

Count: 320
Abstract ID: 83
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

The Role of Inhaled Estradiol and Myrtenol, Alone and in Combination, in Modulating Behavioral and Functional Outcomes Following Traumatic Experimental Brain Injury

Submission Author: Mohammad Amin Rajizadeh

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Background and Aim : Background: Traumatic brain injury (TBI) is an important and growing cause of disability worldwide, and its cogni- tive consequences may be particularly significant. This study assessed the neuroprotective impacts of estradiol (E2), myrtenol (Myr), and the combination of the two on the neurological outcome, hemodynamic parameters, learning and memory, brain-derived neurotrophic factor (BDNF) level, phosphoinositide 3-kinases (PI3K/AKT) signaling, and inflammatory and oxidative factors in the hippocampus after TBI

Methods : Methods: Eighty-four adult male Wistar rats were randomly divided into 12 groups with seven rats in each (six groups to measure intracranial pressure, cerebral perfusion pressure, brain water content, and veterinary coma scale, and six groups for behavioral and molecular studies): sham, TBI, TBI/vehicle, TBI/Myr, TBI/E2, and TBI/Myr + E2 (Myr 50 mg/kg and E2 33.3 µg/kg via inhalation for 30 min after TBI induction). Brain injury was induced by using Marma- rou's method. Briefly, a 300-g weight was dropped down from a 2-m height through a free-falling tube onto the head of the anesthetized animals.

Results : Veterinary coma scale, learning and memory, brain water content, intracranial pressure, and cerebral perfu- sion pressure were impaired following TBI, and inflammation and oxidative stress were raised in the hippocampus after TBI. The BDNF level and PI3K/AKT signaling were impaired due to TBI. Inhalation of Myr and E2 had protective effects against all negative consequences of TBI by decreasing brain edema and the hippocampal content of inflam- matory and oxidant factors and also by improving BDNF and PI3K/AKT in the hippocampus. Based on these data, there were no differences between alone and combination administrations.

Conclusion : Our results propose that Myr and E2 have neuroprotective effects on cognition impairments due to TBI

Keywords : TBI , Myrtenol , Estradiol , cognition

Count: 321
Abstract ID: 357
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Hypothermia, Insulin, and Combined Treatment for Intracranial Hemorrhage After Traumatic Brain Injury

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Background and Aim : Therapeutic hypothermia has been a subject of research in preventing damage after traumatic brain injury (TBI), although it may cause some adverse side effects. To reduce these complications, one can benefit from other interventions. Insulin has proved to be an effective neurotrophic and neuroprotective agent. The present study was designed to evaluate the effects of hypothermia, insulin, and their combination on the volume of cerebral ventricles and intracranial hemorrhage following moderate TBI in male rats.

Methods : In this interventional animal study, 30 adult male Sprague-Dawley rats were included and were randomly divided into five groups: concussion (CON), therapeutic hypothermia (HT), intranasal insulin (INS), combined treatment (HT+INS), and sham (SH). Concussion was applied by dropping a metallic weight to produce a model of moderate TBI (groups CON, HT, INS, and HT+INS). Hypothermia was induced after TBI for 3 hours at 32.5-33.0 degrees Celcius (groups HT and HT+INS). Insulin was administered intranasally which is attested to deliver higher concentrations of this hormone into deep structures of the brain, at day zero after TBI and daily until the seventh day (groups INS and HT+INS). All groups were sacrificed 7 days after TBI, through transcardiac infusion of normal saline and 4% paraformaldehyde (anesthesized with ketamine and xylazine). The volume of cerebral ventricles as well as bleeding were measured via stereology.

Results : The average volume of the ventricles in SH was 5.46 mm3 (1.69), CON 6.17 (2.62), INS 5.23 (1.94), HT 6.31 (2.61), and HT+INS 5.23 (1.13), which yielded no significant difference (p = 0.895). Most hemorrhages were observed in CON, followed by HT, INS, HT+INS, and SH in

order ($p < 0.0001$). The thalamic area was the region with the most frequent instances of hemorrhage, followed by the hippocampal region. An incidental finding was the lower volume of intraventricular hemorrhage in HT+INS compared to the SH (without TBI), although this difference was not significant ($p = 0.134$).

Conclusion : Using each of the hypothermia and intranasal insulin treatments separately as well as simultaneously, intracranial hemorrhage was significantly reduced. There was a synergistic effect with combining these two treatments. It is suggested to investigate the use of this combination in studies with larger samples, or if applicable, the human population. We have also hypothesized that the instances of intraventricular hemorrhage were induced by the method of sacrifice, due to increased intravascular pressure and the subsequent damage to the delicate structure of the choroid plexus, causing intraventricular hemorrhage. Concerning the incidental finding of less intraventricular hemorrhage in HT+INS compared to SH, the possibility is raised that the therapeutic hypothermia, intranasal insulin, and their combination can consolidate the blood-brain-barrier at the choroid plexus, which needs further investigation to be proved.

Keywords : Therapeutic Hypothermia, Insulin, Traumatic Brain Injury, Intracranial Hemorrhage

Count: 322
Abstract ID: 25
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Reparative effects of local and intraperitoneal application of platelet-rich plasma (PRP) in hypothalamic arcuate nucleus lesion model in female rats.

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Background and Aim : In female rats, chemical destruction of the arcuate nucleus causes the cessation of sexual cycles (estrous cycle). In this regard, if the arcuate nucleus is reconstructed and repaired, it is possible to re-establish the estrus cycles. In this research, the restorative or protective effects of PRP on the neurons of the arcuate nucleus were investigated in several different time periods after the destruction of the arcuate nucleus.

Methods : 90 female Wistar rats were divided into 8 experimental groups (n=10) and a control group. The experimental groups included the negative control (bilateral destruction of the arcuate nucleus with quinolinic acid) and the groups receiving local PRP included immediately, 24h, 48h, 72h, (immediately and 24h), (immediately and 24h and 48h), (immediately and 24h and 48h and (They were divided 72h after creating a bilateral lesion in the arcuate nucleus. Then, after 2.5 months of daily smearing, the mice were deeply anesthetized and the brain was removed for RT PCR and brain and ovary for histological studies.

Results : Creating a bilateral lesion of the arcuate nucleus with quinolinic acid causes the cessation or disruption of the estrus cycle, and the administration of PRP protects or restores the arcuate nucleus. The time of post-injury administration and the number of administrations are important in the effects of PRP, and the earlier the application of PRP, the more evident its reparative effects. Counting the neuronal density in the arcuate nucleus and ovarian weight and counting the primary ovarian follicles in the groups receiving local PRP showed a significant difference from each other ($P<0.001$), a significant decrease compared to the healthy control group ($P<0.01$) and a significant

increase with the negative control group (p<0.01). The relative mRNA expression of case peptin, neurokinin B and dynorphin in the groups receiving local PRP is significantly different from each other (P<0.001), a significant decrease compared to the healthy control group (P<0.01) and a significant increase compared to the negative control group (p< 0.01).

Conclusion : The arcuate nucleus was used as a model to evaluate the ability of PRP in repairing nerve lesions or preventing the exacerbation of nerve lesions. Cessation of the estrous cycle and its resumption was considered as a measure to evaluate the restorative or protective effects of PRP. In this regard, the effects of the time factor after applying the lesion in the application of PRP as well as the number of times of its application were considered.

Keywords : Arcuate Nucleus,Estrous cycle,Quinolinic Acide,PRP,KISS1,Neurokinin B,Dynorphine

Count: 323
Abstract ID: 118
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

EMS Pre-Hospital Traveling Times of Spinal Trauma Patients in Iran based on the National Spinal Cord Injury Registry of Iran (NSCIR-IR): Rollover vs Collision accidents

Submission Author: Mohammad Mehdi Mousavi Nasab

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Background and Aim : To evaluate the pre-hospital traveling time and associated factors in patients with spine trauma.

Methods : The National Spinal Cord Injury Registry of Iran (NSCIR-IR) was assessed for data on acute spinal fractures with/without spinal cord injuries in patients transferred via the emergency medical services (EMS) to the NSCIR-IR collaborating hospitals between October 2015 and October 2019. The association between cause of injury, type of accident and pre-hospital time were investigated.

Results : Among the 659 trauma patients included in analysis the mean call time, response time, on-scene time, and transport time were 31.7±48.8min., 11.2±9.5min., 18.4±15.7min., and 22.5±16.7min, respectively. The type of accident correlated significantly with pre-hospital transport time to the acute care hospital, in that pre-hospital transport time in rollover accidents was significantly higher (29.1±17.6 min) compared to the transport time in collision accidents

(19.3±13.6 min) (p=0.002). However, delay in arrival was not statistically significant association between the cause of injury, patients' age, time of day (day/night), and the dependent variables.

Conclusion : In rollover automobile accidents, the pre-hospital time was greater than non-roll over collisions. For future studies, we suggest providing a questionnaire for EMS call centers staff, to ask people who contact them to differentiate between types of accidents. So that, if the accident was rollover road accident, they inform the firefighters as well.

Keywords : Wound and Injuries, Trauma, Spine; Emergency Medical Services; Time

Count: 324
Abstract ID: 126
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

An overview of traumatic spinal cord injury models for preclinical studies

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Background and Aim : Animal models of spinal cord injury (SCI) are used both to study the biological responses and the potential therapies under controlled conditions. An appropriate model should be selected considering the hypothesis and outcomes assessments. In a systematic review, we categorized the SCI animal models, based on the study aims, species, injury techniques, levels of injury, and outcome measurements.

Methods : An extended search was carried out in the electronic databases of Medline.

Results : Among a total of 2870 publications, 2209 fulfilled our inclusion criteria. The most common aims of included studies were the evaluation of different factors or pathophysiologic changes. The most common level of injury was thoracic. Contusion was the most common pattern of injury followed by transection. In the half of studies, both biological and behavioral tests were used to assess outcomes.

Conclusion : Prior to choose an animal model, the study aims should be exactly defined. While contusion models better mimic the neuropathology of human injuries, transection models are helpful to study anatomic regeneration. Rats are the most common and best suited species for SCI models. Newer SCI animal models need to be improved and validated.

Keywords : spinal cord injury; animal model

Count: 325
Abstract ID: 255
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Establishing a Patient Reported Outcome Measure for Spinal Cord Injury and Spine Fracture Patients: Assessing Health Status, Quality of Life, and Life Satisfaction

Submission Author: Homayoon Khaledian

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Background and Aim : To define a patient-reported outcome measure (PROM) for individuals with spinal cord injuries (SCI) or spine fractures, and to assess their health status, quality of life, and life satisfaction.

Methods : Through literature review, potential complications for spinal cord injury patients were identified and compiled into a list. These complications were categorized into 14 specialties (Neurology, Neurosurgery, Urology, Gastroenterology, Pulmonology, Cardiology, Infectious disease, Dermatology, Nutrition, Orthopedics, psychology and psychiatry, Pain, Internal Medicine and Occupational/Physical Therapy). Subsequently, a survey is conducted among specialists to determine the timing for the assessment and reporting of each complication by patients. This survey process includes organizing expert panel sessions and a separate questionnaire is designed for each specialty. The structure of the questionnaire is the same across all specialties and includes a list of identified complications related to the specific field of expertise. The priority of these complications for patient assessment and reporting is determined for intervals of one, three, six months, and one year post-injury, using a 5-point Likert scale (ranging from 0 to 4). After the development of each questionnaire, their content validity is reviewed by faculty members. To assess the reliability of the questionnaire, it is pilot-tested by five experts from each field. Data is analyzed using the SPSS software, and Cronbach's alpha for each questionnaire is calculated. Ultimately, these questionnaires will be tested within a sample of the target population.

Results : In the initial assessment, the most prevalent complications one-year post-SCI were chronic pain (85.7%) within the pain complication category, spasticity (81.4%) within the neurological category, autonomic dysreflexia (73.6%) in the cardiology, UTI (69.3%) in the urological category, and pressure ulcers (57.1%) in the dermatological category. Following this, an expert panel session is conducted where specialists will evaluate these results, proceeding to the subsequent steps as summarized in the methods section.

Conclusion : Given the necessity to define a PROM for SCI patients that specifically addresses the complications, a comprehensive PROM was developed through an extensive literature review and expert pannel discussion. This PROM emphasizes the evaluation of health status, quality of life, and life satisfaction. This provides a structured method to understanding and addressing the multifaceted challenges faced by individuals with spinal cord injuries or spine fractures.

Keywords : : Patient Reported Outcome Measure; Spinal Cord Injury; Questionniare

Count: 326
Abstract ID: 219
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

Adapting International Clinical Practice Guidelines for Rehabilitation Management of Acute Spinal Cord Injury in Iran

Submission Author: Seyedbehnam Jazayeri

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Background and Aim : The main goals of acute spinal cord injury rehabilitation are to minimize functional impairment after injury, promote neuro-recovery, and prevent secondary complications. Rehabilitation is a continuous and time-consuming process, which demands equipment, skilled human resources, and specific strategies to improve patient outcomes. In Iran and other developing countries where resources may be limited, the cost of de novo guideline development can pose a significant challenge. However, a cost-effective alternative is to consider guideline adaptation. In this study we aimed to investigate the adoptability of rehabilitation guidelines for spinal cord injuries with a systematic and evidence-based approach.

Methods : This study was conducted based on guideline adaptation methods (the ADAPTE framework). A search was performed in PubMed, Scopus, Cochrane Library along with five websites of guideline clearinghouses and relevant organizations for relevant records (from January 2011 to April 2021). The search terms were (a) Spinal Cord Injuries; (b) Guidelines, or recommendations; (c) rehabilitation, intervention, practice, or management. Two independent

members of the executive committee screened the titles, abstracts, and full texts of identified publications The assessment of guideline quality was conducted by employing the Appraisal of Clinical Guidelines for Research & Evaluation II (AGREE II). The process of decision-making contained a systemic evaluation of each recommendation, utilizing a combination of feasibility, relevance, acceptance, and adoptability for Iranian healthcare context.

Results : Our selection yielded to one high-quality guideline containing four recommendations. Rehabilitation should be implemented as soon as patients are stable and can tolerate the intensity. We suggest establishing specialized rehabilitation centers with trained personnel and proper equipment, providing tele-rehabilitation, education, and encouraging caregivers to help with early rehabilitation. Negotiating with insurance companies is imperative to cover the cost of long-term rehabilitation. We suggest conventional over-ground training rather than treadmill training due to lack of facilities. Individuals with acute or subacute cervical SCI should be provided with the option of undergoing functional electrical therapy. We also suggest that additional training in unsupported sitting is not necessary beyond what is currently incorporated in standard rehabilitation.

Conclusion : The main finding of our study was feasibility and relevance of adapting international guidelines for the rehabilitation of acute SCI in Iran. Future recommendations are directed toward healthcare policies and rehabilitation management focusing on addressing infrastructure issues and improving optimum functioning while reducing disability. In addition, three major obstacles in implementing clinical practice guidelines for rehabilitation management of individuals with SCI in Iran are lack of specialized rehabilitation centers, economic hardship, and inadequate education among patients as well as personnel. Another recommendation would be to promote tele-rehabilitation for remote areas as this would eventually reduce healthcare costs and deliver care more efficiently. Although adaptation of guidelines from international countries to developing economies such as Iran is challenging, this article offers a framework to apply valuable guidelines for the rehabilitation management of acute SCI, and to expand our knowledge on the optimal timing, type, and challenges in providing rehabilitation following SCI in Iran.

Keywords : Practice Guideline; Rehabilitation; Spinal cord injuries; Developing countries

Count: 327
Abstract ID: 207
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Improving Quality of Care in Traumatic Spinal Column/Spinal Cord Injuries (TSC/SCI) in Iran: A policy brief

Submission Author: Seyedbehnam Jazayeri

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Background and Aim : Well-defined and validated Quality of Care (QoC) indicators can establish useful and practical parameters for healthcare staff and policymakers to improve care. Also, it can help measure and compare health system performances. In particular, the application of indicators can inform policymakers, stakeholders, and clinicians of how patients use healthcare facilities during their injury care and to what extent they are available. By establishing the National Spinal Cord/Column Injury Registry of Iran (NSCIR-IR), we have built the infrastructure to survey patients with traumatic spinal column/ spinal cord injury (TSC/SCI) and obtain the required data for assessing their quality of care. This registry was designed based on a framework for quality control and assurance of data and has a double-check system overseen by physicians and supervisors for increased data validity. In the past eight years, the QoC in patients with TSC/SCIs registered in NSCIR-IR has been evaluated and here we share our recommendations for policymakers.

Methods : We designed a scoping review to summarize the QoC concepts in TSC/SCIs, which were categorized into three domains: health system structure, medical processes, and patient outcomes. These concepts were formulated into indicators (operationalization) and valued through

the Delphi method to create a comprehensive assessment tool which was introduced in our recently published work. After that, we implemented this QoC assessment tool in registered patients across eight referral hospitals in Iran during the eight years of NSCIR-IR registration. In 2022, the pre-hospital, in-hospital, and post-hospital QoC of registered patients with TSC/SCIs in 8 referral hospitals in Iran were studied. Based on this study report, we present recommendations for policymakers in the Ministry of Health and the parliament to improve the QoC in this population.

Results : Based on the study reports, TSCI/SCIs and their complication management were highly influenced by the performance of the health system. In particular, the health system structure and medical processes were identified to affect patient outcomes. Our survey supports the following recommendations: 1) goal setting by emergency medical service providers to transport patients with possible spinal injury to first care facilities in less than 1 hour and to an equipped care facility within 8 hours, 2) the dedication of operating room available 24/7 for patients with TSC/SCIs in referral centers, 3) the distinction between early vs late surgery in patients with TSC/SCIs by healthcare insurance to increase the propensity for early surgery,4) operating a specialized SCI care unit with trained physicians and personnel in the management of acute complications following SCI and 5) early rehabilitation in referral hospitals.

Conclusion : In this study, we made policy suggestions for the Ministry of Health and Parliament to raise the standard of care for patients with TSC/SCIs. The healthcare system's effectiveness significantly impacts the quality of life for patients with TSCI/SCIs. Therefore, policymakers and stakeholders can enhance overall patient outcomes by addressing the pertinent health concerns of TSCI/SCIs. Finally, because Iran is a large developing country with an estimated population of 85 million people, we believe these recommendations can also be considered for all developing countries.

Keywords : Spinal cord injuries; Quality of care; Policy; Recommendations

Count: 328
Abstract ID: 251
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Factors affecting Sexual Health in Individuals with Spinal Cord Injury: A systematic scoping review

Submission Author: Shahryar Ghashghaie

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Objectives: The aim of this study is to review papers to explore factors affecting sexual and partnership adjustment in individuals with spinal cord injury (SCI). Method: This study was based on the methodological framework of scoping reviews. This approach has five methodological steps: determining the research question, identifying relevant studies (searching for related studies), selecting related studies, extracting the data, and collating, summarizing, and reporting the results. The following electronic databases were searched including Medline (PubMed), Scopus, Web of Science, Embase, and Cochrane Library. The publications were included if they reported data about related factors of sexual and partnership adjustment in individuals with SCI. No limitation was considered in terms of time or methodology in the search. Results: We found 14,845 total records; after the full-text screening, 52 studies were included from 1978 to 2019 with various methodologies. The present review demonstrated that proper sexual health among SCI individuals is related to the following factors: Socio-economic status, type of relationship, level of the injury, completeness of the injury, the anatomical, and psycho-social factors. Conclusion: With consideration of factors affecting sexual and partnership adjustment in individuals with SCI, a better estimation of one's sexual health and functioning can be achieved in the clinical settings in order to create a good and effective relationship leading to increased quality of life.

Keywords : Sexual health; Partnership adjustment; Spinal cord injuries; Scoping review

Count: 329
Abstract ID: 388
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

Design of a Dashboard for Monitoring Spinal Cord/Column Injury Care Quality

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Background and Aim : In humans, visual data is perceived significantly faster than textual data. Interactive Dashboards are the most powerful tools for dynamic visualizing and monitoring of performance for decision-making. The National Spinal Column/Cord Injury Registry of Iran (NSCIR-IR) was designed to maximally and efficiently broadcast its diffuse and important data. This has been done through a dashboard (graph and visual displays), instead of static reports (text), and the status of quality of care indicators can be monitored. The objective of this study was to design and development of a visual dashboard as a monitoring system to monitor the quality of care in the NSCIR-IR collaborating centers.

Methods : The indicators used were 20 pre-hospital and in-hospital indicators from the quality of care (QoC) assessment tool. A query in structured query language (SQL) was created from the NSCIR-IR system database to create the BI database. The connection between the dashboard database and the Microsoft Power BI software was established. After data cleaning, filtering of erroneous records, and modeling, visual reports were designed and evaluated.

Results : 17% of registered cases had at least one error in the data needed to calculate the quality of care indicators. Because the dashboard should display indicators correctly, they were automatically filtered by the system. The dashboard shows the QoC for 2,745 patients registered in NSCIR-IR. The most important weaknesses in care included a delay in patient transfer to the first facility by EMS (Mean and SD were 9.54±13.8 hours) and spinal cord decompression (114.5 ±45.3 hours).

Conclusion : Dashboards provide efficient and concise data summaries “at a glance”. However, its value and accuracy are dependent on the quality of information that is inputted. Identifying the data source of errors and correcting them continuously led to improved quality of data, which will facilitate a precise “real-time” dashboard.

Keywords : Indicators and Reagents; Quality of Health Care; Spinal Cord Injuries; Disease Registries; Dashboard

Count: 330
Abstract ID: 92
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Prevalence and Patterns of Spine and Spinal Cord Injuries in Patients Presenting to the Emergency Department

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Background and Aim : Trauma is a significant problem, ranking as the third leading cause of disability and mortality across all age groups. Injuries to the spinal cord and spinal column are particularly impactful, contributing to long-term disabilities. Understanding the occurrence and patterns of these injuries in the emergency room is essential for providing effective resources and methods for managing these patients.

Methods : This retrospective cross-sectional study included all eligible patients who visited the emergency room of Ganjavian Hospital with spinal cord and spinal column injuries. A checklist was utilized to gather clinical information from 759 individuals who experienced spinal injuries between 2020 and 2022. Data analysis was conducted using version 16 of the statistical analysis program SPSS.

Results : The study evaluated a total of 759 patients, consisting of 550 males and 209 females, with a mean age of 39.4 and a body mass index (BMI) of 26.5 ± 3.1. Motor vehicle accidents were the most common mechanism of injury (63.7%), followed by falls from heights (27.5%), whereas altercations and conflicts were the least common (1.4%). The most frequently reported clinical symptoms among patients with spinal column injuries were neck pain (50.7%), chest pain (40.6%), and lower back pain (17.4%), in descending order of prevalence. The most common types of spinal column injuries include vertebral lamina fractures (39%), transverse process fractures (24%), fractures with dislocations (13%), spinous process fractures (11%), compression fractures (10%),

and burst fractures (3%). In terms of the season of injury occurrence, a majority of cases happened during the autumn and summer seasons. The highest number of emergency department visits took place in the afternoon and early morning hours. Cardiac arrest was the primary cause of death among deceased patients. On average, patients were hospitalized for approximately 4.3 days, with durations ranging from 1 to 46 days.

Conclusion : Given the high incidence of accidents in Iran and the resulting spinal injuries, it is crucial for healthcare policymakers to reassess their strategies in managing these patients. By utilizing the findings of epidemiological studies, policymakers can better understand common injury mechanisms, injury locations, the timing of increased hospital admissions, and the duration of hospitalization. Implementing proactive healthcare policies and practices based on these results can lead to improved patient care and a reduction in the societal and healthcare burden associated with spinal injuries in the country.

Keywords : Spine trauma, Spinal cord injury, Adult patients, epidemiological study

Count: 331
Abstract ID: 63
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

Related Fluoxetine and Methylprednisolone changes of TNF-α and IL-6 expression in the Hypothyroidism rat model of Spinal cord injury

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Background and Aim : Spinal cord injury (SCI) is a serious clinical condition that leads to disability. Pro-inflammatory cytokines play an important role in the subsequent secondary events following primary injury. The thyroid hormone (TH) is known as the modulator of inflammatory cytokines and acts as a neuroprotective agent. Methylprednisolone (MP) is used for the early treatment of SCI. Fluoxetine (FLX), also known as a selective serotonin reuptake inhibitor (SSRI), has therapeutic potential in neurological disorders. The aim of the present study was to investigate the combined effects of MP and FLX on SCI in the rat hypothyroidism (hypo) model.
Methods : In this experimental study, 48 male Wistar rats with hypothyroidism were randomly divided into 6 groups (n=8/group): control (Hypo), Hypo+Surgical sham, Hypo+SCI, Hypo+SCI+MP, Hypo+SCI+FLX, and Hypo+SCI+MP+FLX. SCI was created using an aneurysm clip and Hypothyroidism was induced by 6-Propyl-2-thiouracil (PTU) at a dose of 10 mg/kg/day administered intraperitoneally. Following SCI induction, rats received MP and FLX treatments via separate intraperitoneal injections at a dose of 30 and 10 mg/kg/day respectively on the surgery day and FLX continued daily for 3 weeks. The expression levels of tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6) were quantified by Real-time polymerase chain reaction (PCR) and Western blotting. Myelination and glutathione (GSH) levels were analyzed by Luxol Fast Blue (LFB) staining and ELISA respectively.
Results : Following combined MP and FLX treatments, the expression levels of TNF-? and IL-6 significantly decreased and GSH level considerably increased in the trial animals.
Conclusion : Our results show the neuroprotective effects of MP and FLX with better results in Hypo+SCI+MP+FLX group. Further study is required to identify the mechanisms involved.
Keywords : Fluoxetine; Interleukin-6; Methylprednisolone; Tumor Necrosis Factor-Alpha; Spinal Cord Injury

Count: 332
Abstract ID: 166
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

The effect of using the extracellular matrix of adipose tissue on the regenerative effects of bone marrow stem cells in the laboratory model of spinal cord injury in rats

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Background and Aim : Spinal cord injury (SCI) is a debilitating disease. Bone marrow stem cells (BMSCs) have a high potential to regenerate the nerve lesion but have low survival. The use of artificial scaffolds to increase the survival of cells and strengthen their effects had not good results due to the lack of biologically active substances and the effects of immunogenicity and biocompatibility. The extracellular matrix of natural tissue is a good candidate to overcome these problems. The purpose of this research is to use the natural adipose tissue extracellular matrix (AdECM) to enhance the regenerative effects of BMSCs in rat spinal cord injury.

Methods : Extracellular matrix was extracted from rat abdominal fat tissue by physical-chemical method. Then it was converted into a hydrogel using pepsin. Also, we extracted bone marrow stem cells from rat femur, cultured them and used their third passage. One week after the creation of contusion model spinal cord lesion in rats, 10µl of AdECM hydrogel and one million BMSCs were injected in the spinal cord lesion area. Then the animals were evaluated by behavioral tests for 8 weeks. At the end of the eighth week, an electrophysiological examination was performed and spinal cord tissue samples were extracted, stained and histologically performed on them.

Results : The findings showed that BMSCs and AdECM alone increased BBB score significantly and motor performance improved in rats. They also caused a significant decrease in the paw withdrawal reflex time in the hot water test and spinal reflex Latency time compared to the lesion control group. In addition, the histological signs of degeneration reduced and the signs of regeneration and myelination increased. Also, GAP43 protein expression increased significantly. Finally, AdECM enhanced all the effects of BMSCs in spinal cord injury regeneration in rats.

Conclusion : These findings indicate that both BMSCs and AdECM alone repair spinal cord injury in rats to some extent, but AdECM is a useful natural scaffold in spinal cord injury repair and enhances the regenerative effects of BMSCs in the treatment of spinal cord injury.

Keywords : Spinal cord injury, Bone marrow stem cell, Extracellular matrix, Adipose tissue, Repair

Count: 333
Abstract ID: 97
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

30-Day Readmission Rates Following Traumatic Spinal Cord Injury: A Systematic Review and Meta-Analyses

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Background and Aim : Spinal cord injury (SCI), especially involving the cervical spine, can lead to serious adverse effects on people' physical and social functions and the quality of their life. Many survivors require repeated admissions due to complications that occur following the injury and subsequent surgical interventions. Early readmission in spine surgery is increasingly used as a quality-of-care measure to evaluate performance. We aimed to determine The 30-Day readmission and reoperation rates after traumatic spinal cord injury (SCI).

Methods : We systematically reviewed the literature published from Jan. 1990 to July. 2021 via PubMed, Cochrane, and EMBASE. Our primary outcomes were the overall proportion of 30-day readmission following traumatic SCI during the index admission, and inpatient rehabilitation facilities.

Results : A two-phase screening process was conducted by independent reviewers; eight articles met the eligibility criteria for our study. The findings showed that the proportion of readmission

following index admission was 15% (95% CI, 13 - 18). Furthermore, 30-day readmission rates following rehabilitation facilities were 7% (95% CI, 3 - 15). There was no difference between the pre-and post-sensitivity pooled readmission proportion. There was no evidence of potential small-study effects based on Egger's test.

Conclusion : There is no doubt that readmission is an adverse health outcome. The outcome is also complex and multifaceted, which makes it difficult to predict. Injury level is one of the predictors that affect readmission, making it essential to consider factors during discharge planning for high-risk people to reduce 30-day readmission rates.

Keywords : readmission ; reoperation ; spinal cord injury ; Systematic review ; Meta-Analyses

Count: 334
Abstract ID: 544
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

Microfluidic fabrication of polycaprolactone fibers containing polydopamine-magnetic nanoparticles for nerve tissue engineering

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Background and Aim : The complexity in the structure and function of the nervous system and the slow rate of regeneration make its treatment more difficult compared to other tissues of the human body. Nerve tissue engineering, by providing the right environment for the growth and differentiation of nerve cells, develops new methods for the treatment of nervous system diseases. The engineering of 3D scaffolds with body-like architecture and function has shown great potential for tissue regeneration. Among porous scaffolds, scaffolds composed of microfibers can precisely control the pore size and mimic the physiological environment of the body.

Methods : Therefore, microfluidic systems are used due to their high control over fiber diameter, insensitivity to various parameters, high porosity, and excellent repeatability for microfiber production. On the other hand, the microfiber produced by microfluidic method is similar to the environment of the nerve tissue, on which the cells are well aligned. In this study, polycaprolactone microfibers with iron oxide (Fe3O4) nanoparticles at three concentrations of 0.1%, 0.5%, and 1% are produced using the microfluidic method, and the surface of the microfibers is modified with a polydopamine coating. Based on the magnetic, electrical and SEM tests, a concentration of 0.5% iron is selected for the production of microfibers, and polydopamine is coated on these microfibers.

Results : PC12 cells are used for culture on these microfibers. It was observed that cell viability increased by 21.2% on the fourth day and 30.62% on the seventh day in the presence of iron nanoparticles and polydopamine coating. Also, cell adhesion increased significantly in the presence of these two substances. Therefore, the production of polycaprolactone microfibers with

iron oxide nanoparticles and polydopamine coating increases cell behaviors such as cell survival and adhesion, making these microfibers suitable for use in neural tissue engineering.

Conclusion : In a study, polycaprolactone microfibers produced by microfluidic method were used for the cultivation of AHPCs (Adult hippocampal progenitor cells), which was observed to increase adhesion, growth and cell alignment. Also, in another study, Pc12 cells were cultured in the presence of polydopamine and Fe iron nanoparticles, which increased cell viability. The innovation of the conducted research is the simultaneous use of microfluidic method, polycaprolactone polymer, iron nanoparticles and polydopamine coating, which has led to the improvement of cell behaviors.

Keywords : Poly(caprolactone); Polydopamine; Nanoparticles; Microfluidic

Count: 335
Abstract ID: 456
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Microfluidic Manufacturing of Chitosan Microfibrous Scaffolds to Navigate Neuron-like PC12 Cells

Submission Author: Zahra Katoli

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Background and Aim : 2D systems fail to account for interactions between cells and the surrounding environment; these cell−matrix interactions are important to guide cell differentiation and influence cell behavior such as adhesion and migration. Fibrous scaffolds have shown promise in neural tissue engineering due to their ability to improve cell alignment and migration. The microfluidics approach has emerged as a promising technique for fiber fabrication that precisely controls the shape, size, and chemical anisotropy, making it more practical than other fiber fabrication methods.

Methods : In this paper, chitosan (CS) microfibers are fabricated in different diameters using a microfluidic platform by selecting the chitosan solution with a constant flow rate of 0.3 ml min-1 and the sheath flow rate from 2-8 ml min-1 in the microfluidic channel. The CS microfibers were

used to create 3D microenvironments in order to investigate the growth and guide of pheochromocytoma (PC12) cells in vitro for 7 days.

Results : By using this approach, we demonstrated considerable flexibility in the ability to control the size of the fibers. It was shown that the average diameter of the microfibers was obtained in the range of 213 - 87.5 ?m by changing the flow rate. The cell culture results indicated that the 3D topography of the CS substrates supported the adhesion and survival of the PC12, and the number of cells increased over time. Additionally, it was found that the cell was grown along the microfiber.

Conclusion : This reveals the functionality of microfluidic CS fibrous scaffolds for cell alignment is important in applications such as reconnecting serious nerve injuries and guiding the direction of axon growth.

Keywords : neural tissue engineering, chitosan microfiber, microfluidic, PC12 cells.

Count: 336
Abstract ID: 237
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Investigation of the Potential of Anti-RhoA and Anti-ROCK Inhibitors for Locomotor and Sensory Improvement; A Systematic Review and Meta-analysis

Submission Author: Armin Khavandegar

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Background and Aim : Spinal cord injury (SCI) is a devastating condition that often leads to impaired motor function and loss of locomotor abilities, as well as sensory loss. Over the years, researchers have been exploring various interventions to promote recovery and enhance locomotor outcomes in individuals with SCI. One promising avenue of investigation is the inhibition of the RhoA/ROCK signaling pathway, which has shown potential in promoting axonal regeneration and functional recovery after SCI. This systematic review and meta-analysis aim to evaluate the effect of RhoA/ROCK-blockade intervention on locomotor recovery following spinal cord injury in animal models. this article seeks to shed light on the potential of RhoA/ROCK-blockade as a therapeutic strategy for improving locomotor outcomes in SCI patients.

Methods : We will electronically search two main online databases (Medline and Embase) to find all relevant articles. Online translating tools will be utilized for non-English articles. No language limitation will be considered at first.

Results : Based on our anticipation, more than 30 articles will be found. The only two main locomotor assessment tests are the Basso, Beattie, and Bresnahan (BBB) and the Basso Mouce Scale (BMS). Most studies are conducted on rats, except for a few studies on monkeys. Anti-RhoA and anti-ROCK inhibitors were BA-210, EGCG, ?-elemene, C3-exoenzmye, LINGO-1-Fc, Ibuprofen, SiRhoA, iRhoA + FK506, Fasudil, p21Cip1/WAF1, HA-1007, Y-27,632 and

C3bot154-182. The current study is ongoing and the result is not yet completed. By the time of Congress, this systematic review will be completed.

Conclusion : Axonal sprouting and nerve fiber regeneration will be induced after RhoA and ROCK inhibition. Hence, by utilizing them, locomotor as well as sensory recovery can be achieved to some degrees.

Keywords : Spinal cord injury; Rho-associated kinase Inhibitors; Locomotor function; Sensory function

Count: 337
Abstract ID: 225
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

Acellular fetal skin in prenatal treatment of myelomeningocele: A preclinical study

Submission Author: Alireza SoltaniKhaboushan

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Background and Aim : Myelomeningocele is a severe form of spina bifida that affects 1 in every 1000 live births worldwide. This condition can result in a range of complications, including paralysis, bladder and bowel dysfunction, and mental health issues (1, 2). Recent research has indicated that fetal treatment of myelomeningocele can provide better outcomes than postnatal (3, 4). However, this approach presents certain challenges, such as a shortage of tissue for covering lesions, incomplete regeneration, and complex surgical procedures (2). We propose a tissue engineering-based solution that can enhance the effectiveness of fetal treatment of myelomeningocele, which may improve patient outcomes and quality of life.

Methods : The harvested skin tissue was frozen and thawed before the application of the decellularization process. Sodium dodecyl sulfate (SDS) and Triton X-100 were used for decellularization. H&E and DAPI staining were used to confirm the effectiveness of the protocol.

The lack of toxicity of the tissue and proliferation of cells on the tissue was confirmed via the MTT test. The scaffold was transplanted via fetal surgery on the defect in the rat model of myelomeningocele. IHC evaluation for CK 5/6 was done 4 days later at term to detect keratinocytes.

Results : Histopathologic evaluations confirmed the effectiveness of the decellularization process (Fig1). The MTT test showed that the absorbance was not different in the tissue group compared to controls ($P > 0.05$ in all 3 time points), and tissues do not cause cell toxicity. Moreover, the proliferation of cells was desirable on the scaffold, and it was significantly higher on day 7 compared to day 5 and day 3 ($P < 0.05$) (Fig 2). Appropriate coverage of defect was observed by gross evaluation of defect. IHC evaluations demonstrated the epithelization of the intrauterine transplanted scaffold (Fig3).

Conclusion : of human skin, creating a scaffold that could serve as a potential construct for the fetal treatment of myelomeningocele lesions. Figure 4 shows a summary of tissue engineering-based approaches in fetal myelomeningocele treatment.

Keywords : Regenerative medicine, spinal cord injury, myelomeningocele, spina bifida, stem cell

Count: 338
Abstract ID: 233
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Histopathological Effects of the Intrathecal Chondroitinase-ABC Administration in Spinal Cord Injured Rats; A Systematic Review

Submission Author: Arman ZeinaddiniMeymand

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Background/Objectives: Chondroitinase ABC (ChABC) has been known as a potential treatment option for spinal cord injury (SCI). We aim to identify and evaluate the histopathological effects of intrathecal ChABC administration in SCI rat models. Methods: We searched PubMed/MEDLINE, Scopus, Web of Science, Embase, and Cochrane Library for studies published from the inception of each database until 22 November 2022. Results: Of 3857 screened citations, 17 studies met eligibility criteria and were entered into the qualitative analysis. Sixteen studies were of high quality and one study was of medium quality. The Four main types of rats used in studies included Sprague Dawley, Wistar, Lister hooded and Long-Evans rats, respectively. ChABC treatment phases were considered acute (within 24 hours after injury), sub-acute (five or seven days after injury), or chronic (four or six weeks after injury). Accordingly, ChABC administration in the acute phase of injury significantly reduced cyst formation and promoted tissue preservation and sensory neuron plasticity. Regardless of the treatment phase, ChABC administration significantly promoted serotonergic and corticospinal fiber plasticity. Nine of the 14 studies that reported on functional outcomes found that ChABC administration either

alone or combined with other treatments including rehabilitation improved motor functions. Conclusions: The specification of anatomical changes for ChABC treatment can be used to explain functional improvements that have been reported in SCI. The limited studies on more clinically relevant contusion and compression injury models warrant further studies on these injury models and alternate treatment phases.

Keywords : Chondroitinase ABC, Histopathology, Spinal Cord Injuries, Functional outcome

Count: 339
Abstract ID: 390
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

The Frequency of Osteomyelitis after Pressure Ulcer in Spinal Cord Injury: A Systematic Review

Submission Author: Arman ZeinaddiniMeymand

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Background and Aim : Pressure ulcers (PUs) in patients with spinal cord injury (SCI) are a potential lifelong complication that can affect various aspects, including physical, mental and social well-being as well as their overall quality of life. The prevalence of PUs in individuals with SCI ranges from 10.2 to 40%. In this study we aimed to determine the global frequency of osteomyelitis in individuals with traumatic spinal cord injury (SCI) and pressure ulcers (PUs).

Methods : A comprehensive search on PubMed, EMBASE, Scopus, and Web of Science has been conducted until August 2023. The Cochrane Handbook for Systematic Reviews was followed. Case-control, cohort, and cross-sectional studies included participants diagnosed with SCI and represented with PUs or osteomyelitis without language restriction. Data collection was performed by four reviewers in two groups. We used the Newcastle-Ottawa Quality Assessment Scale (NOQAS) for quality assessment. The Chi-squared and I2 tests were applied to detected heterogeneity between studies. Also, a random-effect model was performed for report data.

Results : A total of 886 patients from 16 studies were included. The overall frequency of osteomyelitis among individuals with SCI suffering from PU was 24.3% (95% confidence interval:

0.19 to 0.39) that mainly located in the pelvic. Regarding SCI levels, patients were mainly tetraplegic (n=308).

Conclusion : Our results indicated that the overall frequency of osteomyelitis among individuals with SCI amd PUs was 24.3%. Also, tetraplegia and pelvic PUs were more common SCI levels and location of osteomyelitis among this group of patients, respectively. As the previous studies indicated, the biopsy is a standard gold method for the diagnosis of osteomyelitis.

Keywords : Osteomyelitis; Pressure Ulcers; Spinal Cord Injuries

Count: 340
Abstract ID: 369
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

The Face-validity of the Global Burden of Disease Estimates for Spinal Cord Injury: A Brief Report

Submission Author: Elaheh Khodadoust

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The study of the Global Burden of Diseases (GBD) provides a great wealth of knowledge about the epidemiology of SCI and provides the most comprehensive dataset that has existed for SCI at the global, regional, and national levels. The data reported in GBD should be interpreted with care. There are numerous cultural, economic, and social factors that influence the incidence and prevalence of SCI among countries in the world. The estimated numbers provided in the GBD study are derived by applying a comprehensive and complex methodology based on the etiology of SCI; however, the cause of SCI differs significantly from one region to the next. Comparing the results of the GBD study with the published epidemiological studies shows that GBD provides significantly higher estimates for SCI compared with the published data in the literature.

Keywords : Incidence, Traumatic Spinal Cord Injury, Global Burden of Disease

Count: 341
Abstract ID: 294
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Iranian addition to the literature on modern neurosurgery based on Persian literature: a Quality and quantity analysis of scientific progress over the past decades

Submission Author: Saeed Kargarsoleimanabad

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Background and Aim : The field of neurosurgery has seen significant progress in recent years, with a shift towards more research and publication. This trend is also observed among Iranian neurosurgeons. A study aims to analyze the quantity and quality of scientific publications by Iranian neurosurgeons, considering the lack of previous data in this area. The establishment of the first neurosurgery service at Tehran University of Medical Sciences in 1950 played a crucial role in the development of neurosurgery in Iran. In the past, neurosurgeons focused primarily on patient care, but with the advent of evidence-based medicine, they have become more involved in research and publication. Iranian scientists have witnessed a remarkable improvement in the quality and quantity of their publications, with Iran having the highest annual growth rate of scientific publications in the world in 2011. The study aims to shed light on the contributions of Iranian neurosurgeons to the field of neurosurgery through a comprehensive analysis of research metrics.

Methods : This bibliographic study evaluates all studies in the field of neurosurgery conducted by researchers affiliated with Iranian universities. Initially, a comprehensive search was conducted on databases including SID, Magiran, Irandoc, and Google Scholar. Then, all studies conducted by researchers affiliated with Iranian institutions were selected, and variables such as study type, research scope, number of citations, impact factor, etc., were evaluated. The annual growth rates of Iranian publications were calculated for all papers published.

Results : a total of 1350 studies published by 431 authors in the field of neurosurgery were analyzed. The average number of authors per article was 4.12, which had significantly increased over the past two decades ($p<0.001$). Original articles, case reports, and reviews accounted for the highest number of publications, with 51.5%, 33.2%, and 8.3%, respectively. Clinical trials and systematic reviews had the highest increase in the number of published articles, and 100 articles were published in domestic journals. In terms of subject matter, studies related to the spine accounted for approximately 33.1%, trauma 21.5%, tumors 20.8%, neurovascular 15.8%, and 8.8% of articles were in other areas. Overall, the study demonstrated a significant increase in the quantity and quality of research by Iranian authors in recent years, particularly from 2010 onwards. Additionally, private institutions and hospitals have also significantly contributed to research output in collaboration with academic institutions over the past two decades.

Conclusion : A substantial surge in both the quantity and quality of Iranian research papers has been witnessed over the past decade, as evidenced by a greater number of papers falling into higher Levels of Evidence (LOE) categories.

Keywords : neurosurgery, publication, Iran, Bibliography

Count: 342
Abstract ID: 364
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

MicroRNA-22: a Novel and Potent Biological Therapeutics in Neurological Disorders

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Background and Aim : MicroRNAs (miRs) are regulatory RNAs with 18–25 nucleotide lengths involved in various biological processes. Some miRs, including miR-22, play an essential role in regulating neurological disorders. MiR-22 is a brain-enriched regulatory element involved in angiogenesis, energy supply, adjustment of ionic channels, and suppression of malignant cell proliferation, migration, and invasion.

Methods : This article discusses the protective and therapeutic effects of miR-22 on neurological diseases and injuries, including cerebral ischemia, neurodegenerative diseases, epilepsy, and brain malignancies. We also correlated miR-22 with amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), panic disorders, schizophrenia, neural tube defect (anencephaly), and traumatic brain injury.

Results : MiR-22 is a potent protective agent against many neurological disorders, including Alzheimer, Parkinson, Huntington diseases, epilepsy, cerebral ischemia, and brain malignancies, including glioblastoma, glioma, and medulloblastoma. This miR exerts its protectivity through various mechanisms, including suppressing the overproduction of ROS and inflammatory factors, inhibiting normal cell apoptosis, and some other molecular mechanisms. It also exerts its effects via some known targets such as TRPM7, SNAIL- 1, and PAPST1.

Conclusion : MiR-22, with the mentioned acts and potential, can be an ideal therapeutic target/agent for neurological disorders. Regarding the therapeutic potential of miR-22, we suggest the design of (pre)clinical trials to use this RNA as a biological therapeutic agent in brain disorders and possibly other organs. Either delivery of the synthetic miR-22 to the CNS or blocking its inhibitors via small molecules can exhibit neuroprotective effects in different neuropathological conditions. The roles of miR- 22 in axon regeneration and suppressing malignancy are particularly interesting to explore. Using smart nanoparticles can guide us to a superior therapeutic capability with lesser off-targets.

Keywords : MicroRNA-22 · Neuroprotective · Neurodegenerative diseases · Brain malignancies · Stroke, RNA therapeutics

Count: 343
Abstract ID: 361
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Neuroprotective Effects of Silymarin in 3-Nitropropionic Acid-Induced Neurotoxicity in Male Mice: Improving Behavioral Deficits by Attenuating Oxidative Stress and Neuroinflammation

Submission Author: Shahla Eyvari

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Background and Aim : 3-Nitropropionic acid (3-NP) is strongly believed to be an irreversible inhibitor of mitochondrial complex II, leading to neural damage. This study aimed to investigate the neuroprotective effects of silymarin against 3-NP-induced neurotoxicity in male mice.

Methods : Six-week-old mice received subacute doses of 3-NP intraperitoneally for 17 days. Mice were given silymarin (70 mg/kg/day, P.O.) for two weeks before 3-NP administration or for 4 weeks after 3-NP administration. At the end of the treatment schedule, animals were evaluated for behavioral alterations. Subsequently, neuronal damage in the hippocampus region of the brain tissues, oxidative stress-related parameters (lipid peroxidation, nitric oxide, superoxide dismutase, glutathione, and total antioxidant capacity), and pro-inflammatory cytokine (TNF-α, IL-17, and IL-1β) levels were evaluated.

Results : Our results indicated that 3-NP treatment significantly ($p<0.05$) tended to reduce motor coordination, memory, and neuronal antioxidant status while increasing pro-inflammatory cytokine levels. However, silymarin in both treatment and pretreatment protocols markedly ($p<0.05$) attenuated the behavioral deficits, oxidative stress status, and neuroinflammation.

Conclusion : . The results of the current study suggest that the neuroprotective effect of silymarin against 3-NP-induced neurotoxicity might be due to the mitigation of oxidative stress status and provide insight into the therapeutic potential of silymarin.

Keywords : Silymarin; 3-Nitropropionic acid; Neurotoxicity; Oxidative stress; Neuroinflammation.

Count: 344
Abstract ID: 401
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Hydro-ethanolic extract of pomegranate peel improved learning and memory and attenuated oxidative stress in the brain in a rat model amnesia induced by cholinergic dysfunction

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Background and Aim : Pomegranate fruit is known to have some beneficial effects in the nervous system. Pomegranate peel has been reported to have neuroprotective and antioxidant effects. In the present study, the effects of hydro-ethanolic extract of pomegranate peel on learning, memory, acetylcholinesterase (AchE) activity, oxidative stress indicators , and mRNA expression of nuclear factor erythroid 2-related factor 2 (Nrf2 and heme oxygenase (HO)-1 was investigated in a rat model of amnesia induced by scopolamine.

Methods : The rats were divided into 5 groups including: (1) Control, (2)Scopolamine, (3) Scopolamine –Extract 200, (4) Scopolamine –Extract 400 and (5) Scopolamine –Extract 800 groups. The rats of the groups 3-5 orally received 200, 400 and 800 mg/ kg of the extract respectively, during 3 weeks. Scopolamine injection was done in 2-5 groups at the third week 30 min before the Morris water maze (MWM) and passive avoidance (PA) tests. The rats were finally sacrificed, the brains were removed, and oxidative stress indicators (malondialdehyde (MDA) and thiol concentration and superoxide dismutase (SOD) activity) and AchE activity were measured. Expression of Nrf2 and HO-1 mRNA were also investigated.

Results : The rats of scopolamine group showed a longer traveling time and distance to reach the platform in the MWM test. Scopolamine group also travelled shorter time and distance in the target area of MWM. The rats of scopolamine group also had shorter latency to enter the dark segment and spent longer time in the dark part in the PA test. Learning and memory impairment induced by scopolamine was accompanied with a decrease in thiol content and SOD activity in the brain of scopolamine group. Scopolamine injection increased MDA concentration and AchE activity,

and decreased expression of Nrf2 and HO-1 mRNA in the brain of scopolamine group. The rats of extract treated groups (200- 800 mg/ kg) decreased the traveling time and distance to reach the platform in MWM. All doses of the extract also increased the time and distance in target area in MWM. In PA test, the extract increased latency to enter the dark and total time spent in the light but decreased the time spent in the dark and number of entries into the dark. The biochemical data showed that the MDA concentration and AchE activity were decreased but SOD activity and expression of Nrf2 and HO-1 mRNA were increased by the extract.

Conclusion : Hydro-ethanoic extract of pomegranate peel improved learning and memory in a rat model of amnesia induced by scopolamine. The possible mechanism(s) are including attenuation of AchE activity, protection against oxidative stress and targeting the Nrf2 and HO-1 pathway.

Keywords : Pomegranate peel, Learning, Memory, Oxidative Stress, Scopolamine

Count: 345
Abstract ID: 433
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Pretreatment with minocycline protected brain against long-term brain injury and depressive- and anxiety-like behaviors

Submission Author: Hedyeh Askarpour

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Background and Aim : Sepsis, a life-threatening condition associated with multiple organ dysfunction, exerts a profound impact on the brain through systemic inflammation, resulting in a severe condition known as sepsis-associated encephalopathy. Beyond its acute manifestations, sepsis can also trigger lasting brain damage, persistent inflammation, and a range of behavioral abnormalities. Furthermore, research has demonstrated that sepsis survivors may encounter cognitive impairments and mood disorders that persist for years after their hospital discharge. This study investigates the potential preventive effects of Minocycline on the long-term consequences of sepsis on the brain in a mice model.

Methods : Adult male C57 mice were subjected to experimental sepsis through a single intraperitoneal injection of 5 mg/kg lipopolysaccharide (LPS). Minocycline administration via oral gavage (12.5, 25, and 50 mg/kg) commenced three days before sepsis induction and continued on the day of induction. After completing the designated treatment regimen, the administration of Minocycline was discontinued, and the mice were maintained under standard conditions for a period of one month. Subsequently, a battery of behavioral assessments, which included the tail suspension test (TST), elevated plus maze (EPM), and open field (OF) test, was conducted to evaluate the mice's behavior. Then mice were anesthetized using a ketamine/xylazine injection and sacrificed to collect the brain tissues to evaluate oxidative stress markers, including malondialdehyde (MDA) levels, thiol content, and superoxide dismutase (SOD) activity in the cortical tissues.

Results : One-month following sepsis induction, mice exhibited significant anxiety- and depressive-like behaviors as determined by assessments in the elevated plus maze, open field, and tail suspension test. Brain tissue analysis revealed a notable increase in oxidative stress markers and reduced capacity of anti-oxidant defense in the cortical tissue of septic mice. Minocycline in a dose-dependent manner (50 mg/kg being most effective while 12.5 mg/kg not effective) effectively ameliorated the long-term behavioral abnormalities resulting from sepsis, reduced lipid peroxidation, and strengthened anti-oxidant defense compared to non-treated septic mice.

Conclusion : These findings underscore the potential of minocycline as a therapeutic intervention during sepsis induction to prevent the enduring behavioral consequences of sepsis in murine models. The study sheds light on the promising role of Minocycline in safeguarding the brain against the long-term consequences of sepsis and highlights its potential as a therapeutic agent in sepsis-related neuroinflammatory conditions.

Keywords : Sepsis-Associated Encephalopathy; Minocycline; Oxidative stress; Depression; Anxiety

Count: 346
Abstract ID: 446
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Evaluation of the modulatory role of electromagnetic field on acute and chronic stress effects on conditioned fear memory

Submission Author: Kataneh Abrari

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Background and Aim : Learning and memory play an important role in daily life, so that many factors can negatively affect memory and its function. One of the most important cause is stress to find a way to reduce the effects of stress on memory can help to improve the quality of life. Today, there are many reports of the positive effects of the magnetic field as a means of healing. The purpose of the present study was to investigate the beneficial and therapeutic effects of magnetic fields on memory disorders caused by acute, chronic stress and the combination of both of these stresses, in male rats.

Methods : Animals were divided into four groups (Control, Chronic Stress, Acute Stress, and Acute-Chronic Stress), and each group subdivided into treated and sham subgroups. Treated groups were kept in the system with magnetic field generator on. These groups were acute stress + treated, chronic stress + treated, acute and chronic stress + treated. The other group was exactly the same as the treated group, with the exception that they were placed in a silent magnetic field generator. Chronic and acute stress group were exposed to 5 Hz & 25 Hz respectively and outputs intensity was 70 gauss. Behavioral studies were performed by, a Fear Conditioning System, Elevated Plus Maze and Open Field. After inducing each strain model, the stress hormone (corticosterone) was measured by taking blood samples from animals.

Results : The results of this study showed that acute, chronic or combined stress significantly reduced the conditional fear memory, and that in all cases, treatment with magnetic waves improved the conditional fear memory. Animal-induced stress significantly increased the

sensitized fear. While the treatment with magnetic waves moderated this effect. Acute and chronic stresses and their combination significantly reduced the number of entry and staying in the open arm, indices indicating anxiety in the elevated plus maze, which was significantly improved by applying magnetic field.

Conclusion : The results of this study showed that the magnetic field can improve behavioral disorders of various types of stress, such as fear and anxiety. The promise is that it will be used as a therapy, without having side-effects, in today's stressful life.

Keywords : Stress, magnetic field, memory, conditioned fear

Count: 347
Abstract ID: 460
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Ameliorating Effect of Pistachio Hydroalcoholic Extract on Cisplatin-Induced Nephrotoxicity in Mice

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Background and Aim : Cisplatin-induced nephrotoxicity accompanies increased oxidative stress, leading eventually to kidney dysfunction. On the other hand, Pistacia vera nuts (pistachio) display multiple pharmacological effects such as antioxidant property. The present study investigated the effects of pistachio hydroalcoholic extract on nephrotoxicity induced by cisplatin in mice

Methods : Pistachios (100 g) were powdered and macerated in 1 L of ethanol (80%) for 72 h Then, dried with rotary evaporator apparatus. Forty male mice were divided into five groups: normal, cisplatin, cisplatin+DMSO, cisplatin+ pistachio hydroalcoholic extract 10, and cisplatin+ pistachio hydroalcoholic extract 100. Nephrotoxicity was induced by intraperitoneal injection of cisplatin (20 mg/kg/day) on the first day of the experiment. Pistachio hydroalcoholic extract (10 and 100 mg/kg/p.o) was administered for four consecutive days. The body weight and kidney function indices such as serum creatinine (Cr) and blood urine nitrogen (BUN) were measured. Also, the renal tissues were assessed for levels of malondialdehyde (MDA), catalase (CAT), superoxide dismutase (SOD), and glutathione peroxidase (GPx).

Results : Cisplatin reduced animals' body weight. Also, cisplatin increased levels of Cr, BUN, and MDA, and decreased the activities of SOD, CAT, and GPx. Treatment with pistachio hydroalcoholic extract (100 mg/kg) reduced the levels of serum Cr, BUN, as well as renal MDA. Moreover, administration of 100 mg/kg pistachio hydroalcoholic extract to cisplatin-treated mice increased the body weight as well as CAT, GPx, and SOD activities.

Conclusion : These results imply that pistachio hydroalcoholic extract treatment may diminish cisplatin-induced renal dysfunction through reduction of oxidative stress in the kidney tissue

Keywords : cisplatin; mice; nephrotoxicity; oxidative stress; pistachio

Count: 348
Abstract ID: 531
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Comparison of behavioral indices of harmaline-intoxicated rats with low, medium and high doses of WIN 55 212, a cannabinoid receptor agonist

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Background and Aim : The central nervous system is influenced by the psychoactive compound harmaline, which is known to induce tremors and convulsions in animals, including mice. In contrast, WIN 55,212, a synthetic cannabinoid receptor agonist, binds to the same receptors as THC, the naturally occurring compound found in marijuana. When mice are exposed to harmaline, there is an increase in neuronal activity leading to tremors and convulsions. Although the exact mechanism of harmaline-induced tremors is not fully understood, it is believed to involve the inhibition of the neurotransmitter GABA, which typically inhibits neuronal activity. Animal models have demonstrated that low doses of WIN 55,212 possess anti-convulsant properties. It is hypothesized that WIN 55,212 acts on the endocannabinoid system, which regulates neuronal activity. By activating cannabinoid receptors, WIN 55,212 may counteract the heightened neuronal activity caused by harmaline, thereby reducing tremors and convulsions. It is crucial to recognize that the effects of WIN 55,212 may vary based on dosage and individual mouse responses. Further research is necessary to comprehensively understand the potential therapeutic effects of WIN 55,212 on harmaline-induced toxicity in mice.

Methods : In this experiment, Wistar rats weighing between 40 to 60 grams were used. The rats were injected with three doses of WIN, 0.1, 0.5, and 1 mg/kg, 30 minutes before administering harmaline at 30 mg/kg. After 30 minutes, behavioral tests included open field data, wire griping duration, rotarod duration, and step widths and lengths.

Results : The results of the administration of WIN at doses of 0.1, 0.5, and 1 mg/kg showed significant findings. In terms of mobility, the group treated with 1 mg/kg of WIN exhibited significantly lower mobility compared to the other groups. However, when it comes to total distance moved and velocity, no significant differences were observed between the groups. In terms of specific activities, the group treated with 0.5 mg/kg of WIN showed significantly lower rearing, grooming, hanging, and time on the rod compared to the other groups. Interestingly, there were no significant differences observed in step widths, left step length, and right step length between the groups. These results suggest that WIN at different doses can have varying effects on mobility and specific activities in Wistar rats, with the 0.5 mg/kg dose showing the most pronounced effects on certain behaviors.

Conclusion : Based on the findings, it can be concluded that different doses of WIN 55,212 can have varying effects on specific behavioral indices in harmaline-intoxicated rats. The higher doses of WIN 55,212 resulted in reduced overall mobility, while the medium dose (0.5mg/kg) had a more significant impact on reducing specific behaviors such as rearing, grooming, hanging, and time on the rod. These findings suggest that WIN 55,212 has the potential to be used as a therapeutic agent for mitigating harmaline-induced toxicity and its associated behaviors. However, further research is needed to fully understand the underlying mechanisms and to determine the optimal dosage for achieving desired therapeutic outcomes. Overall, this study provides valuable insights into the potential use of WIN 55,212 as a therapeutic agent for treating harmaline-induced toxicity in rats.

Keywords : cannabinoid receptor, harmaline toxicity, Marihuana locomotor activity

Count: 349
Abstract ID: 169
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Melatonin alleviate arsenic induced toxicity in rat cerebellum

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Background and Aim : Arsenic is known as a metalloid, and its exposure mainly through consuming contaminated water is considered the greatest threat to public health. Several studies reported neurotoxicity induced by arsenic through oxidative stress and apoptosis. Melatonin has strong antioxidant properties that can reduce free radicals and change cellular signaling pathways in different pathological situations. Hence, this study was done to examine the protective effect of melatonin against arsenic toxicity via oxidative stress and apoptosis in rat cerebellum.

Methods : Thirty male Wistar rats treated by arsenic (15 mg/kg; gavage) and melatonin (10 and 20 mg/kg, intraperitoneally; i.p.) daily for 28 consecutive days. The MDA and GSH as oxidative stress markers and Bax/Bcl-2 ratio, Cleaved caspase-3, survivin, and Mcl-1 as apoptosis proteins determined in rats cerebellum.

Results : The arsenic exposure enhanced MDA level and significantly diminished GSH content. Additionally, arsenic increased Bax/Bcl-2 ratio and cleaved caspase-3 and reduced the expression

of survivin and Mcl-1. Furthermore, the co-administration of melatonin could reverse the effects of arsenic in cerebellar tissue by inhibiting oxidative stress and apoptosis.

Conclusion : In conclusion, our results demonstrated that melatonin with anti-oxidative and anti-apoptotic mechanisms could prevent neurotoxicity caused by arsenic in rat cerebellum.

Keywords : Arsenic, Melatonin, Neurotoxicity, Anti-apoptotic, Survivin.

Count: 350
Abstract ID: 151
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Neuroprotective efficacy of Evodiamine in a rat model of Parkinson disease

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Background and Aim : Evodiamine is a chemical compound extracted from the plant genus TetradiumA. large body of evidence supports a role of oxidative stress as a major factor of cell death in Parkinson's disease (PD). Natural antioxidant agents can enhance the immunological ability leading to healthier though they usually have several mixture. For PD, natural antioxidant polyphenol agents are good candidate for treatment, because the pathogenesis of PD is complex with many pathways. These effects are more evidence when the clinic trial is for long term treatment. This study focused on the protecting effects of natural antioxidants on neurons in PD, especially summarized the results about protective effect of Evodiamine on neurons against cell death of animal PD models.

Methods : : Therefore, this study examined whether Evodiamine administration would attenuate behavioral and histological deformities in an experimental model of PD in rat. For this purpose, unilateral intrastriatal 6-hydroxydopamine (6-OHDA)-lesioned rats were pretreated with a Evodiamine 1 h before surgery. Apomorphine-induced rotations and the number of Nissl-stained neurons in the substantia nigra pars compacta (SNC) were counted after 2 weeks.

Results : Evodiamine administration could attenuate the rotational behavior in lesioned rats and protect the neurons of SNC against 6-OHDA toxicity.

Conclusion : : Evodiamine administration has a protective effect against 6-OHDA toxicity.

Keywords : : Parkinson disease, Evodiamine

Count: 351
Abstract ID: 113
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

The preventive effect of NMDA receptor inhibition on brain inflammation and behavioral impairment induced by sepsis in mice

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Background and Aim : Brian inflammation has been repeatedly reported to be occur after septic condition. Behavioral impairment including cognition disturbance is reported to be seen in the patients which is long lasting. Glutamate excitotoxicity and overactivation N-Methyl-D-Aspartate (NMDA) receptors is suggested to have a main role in the brain diseases including neurodegenerative disorders. It seems that brain inflammation disrupts clearance of glutamate while, it enhances glutamate release which both of them contribute in brain consequences of glutamate. In this study, the preventive effect of NMDA receptor inhibition on brain inflammation and behavioral impairment induced by sepsis was investigated in mice

Methods : Male adult C57mice were used in the present study. A high dose (5 mg/ kg) of lipopolysaccharide (LPS) was intraperitoneally injected to induce sepsis in mice. Memantine(5, 10 or 20 mg/ kg) as a NMDA receptor antagonist was gavaged. Treatment by memantine was started since 3 days before sepsis induction and it was continued up to three days after LPS injection. At 24 h after memantine injection, 5 mice from each group were sacrificed and and nuclear factor kappa B (NF-κB), tumor necrosis factor (TNF)-α, and interleukin (IL)-1β mRNA expression and concentration of oxidative stress indicators were measured in the collected brain samples. At 30 days after LPS injection, 10 mice from each group were used and the behavioral tests were done. Finally, these mice were sacrificed and oxidative stress indicators and acetylcholinesterase (AChE) activity were measured in the collected brains.

Results : The results showed that brain tissue malondialdehyde (MDA) concentration and TNF-α, IL-1β, and nuclear factor kappa B (NF-κB) mRNA expression were increased at early stage of sepsis while, superoxide dismutase(SOD) and thiol content were decreased. Memantine attenuated MDA and mRNA expression of proinflammatory markers. Memantine also improved total thiol content and SOD activity in the brain. One month after sepsis induction, the mice showed a significant impaired in novel object recognition, tail suspension, elevated plus maze, and open field tests. An elevation in the MDA level and AChE activity was observed in the brain of mice at 30 days after sepsis induction while, SOD activity and total thiol content were decreased. Interestingly, MDA level and AChE activity were decreased by 10 and 20 mg/kg of memantine. Memantine also improved thiol concentration, SOD activity, and behavioral performance when that mice were examined at 30 days after sepsis.

Conclusion : Considering these results, it is suggested that NMDA receptor inhibition by memantine at early stages after sepsis induction attenuated oxidative stress, cholinergic dysfunction and long lasting behavioral disturbances induced by sepsis in mice.

Keywords : N-Methyl-D-Aspartate, Memantine Sepsis, Cholinergic dysfunction, Oxidative stress, Cognitive impairment.

Count: 352
Abstract ID: 111
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Measurement of inflammatory factors (TNF-α) in the cerebrospinal fluid of dogs suffering from neurological distemper: effect of TNF-α -secreting DC on T-Cell proliferation

Submission Author: Akram Aminian

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Background and Aim : Neurodistemper virus has a wide range of hosts. The clinical symptoms of this disease, depends on: age and the immune status. Neurological symptoms include seizures, cerebellar and vestibular symptoms, paralysis of one or all four limbs with imbalance or common myoclonus are. Sensory nerves release bioactive peptides. which activates dendritic cells by connecting to their specific receptors. TNF-a cytokine, the master switch for transformation of the condition from inflammation to leukoencephalitis. TNF-alpha has an inhibitory effect on the proliferation of T-helper immune cells through dendritic cells. For this study, CSF was sampled from 10 dog collars with non-distemper neurological disease and 23 dog collars with neurological distemper disease. The results of this study showed that the expression level of TNF-a increased in the studied groups. According to previous studies, the high level of this inflammatory factor is a cause of Decreased proliferation of T-cells in neuroviral disease.

Methods : Totally 10 dogs with non-distemper neurological disease and 23 dogs with neurological distemper were studied. They were checked for history of other neurological diseases. The data were expressed as the Mean±SE (Standard Error Mean). Kruskal-Wallis non-parametric test was used for analysis. Statistical analysis was done using Prism version 6.07 software. P-values less than 0.05 were considered significant

Results : Results of RT-PCR showed that TNF-a expression levels was 17.6 from 16.9 (control group compared to disease group). There is a significant increase in level of TNF-a cytokine. A significant difference was observed. They were also confirmed in the ELISA results.

Conclusion : This targeted study shows that the status of Inflammatory state of distemper disease should be considered Because of its connection with inhibitory effect on T-Cell proliferation. Investigating the chronic role of TNF-a in the Exacerbation of neurological neuro-distemper diseease should be considered.

Keywords : Neurodistemper virus- TNF-a- T-cells - dendritic cells

Count: 353
Abstract ID: 116
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Minocycline Ameliorate Sepsis-Induced Neuroinflammation and Oxidative Damage and Accelerate Mice Recovery from Sepsis

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Background and Aim : Sepsis is associated with brain injury and acute brain inflammation, which can potentially transition into chronic inflammation, triggering a cascade of inflammatory responses that may lead to neurological disorders and long-term behavioral abnormalities. Minocycline, recognized for its potent anti-inflammatory properties, particularly within the brain. This study explores the potential preventive effects of Minocycline on the long-term consequences of sepsis in a mice model of sepsis.

Methods : Adult male C57 mice (8-10 weeks old) received pretreatment with different doses of minocycline (12.5, 25, and 50 mg/kg) three days before sepsis induction. An intraperitoneal injection of 5 mg/kg lipopolysaccharide (LPS) was used to induce sepsis. Spontaneous locomotor activity (SLA) and weight changes were assessed over several days post-sepsis to monitor the recovery of the mice. The expression of inflammatory mediators including tumor necrosis factor-α (TNF-α), interleukin-1β (IL-1β) and nuclear factor kappa B (NF-κB) were assessed in the hippocampal tissues. Oxidative stress markers including, malondialdehyde (MDA), total thiol and superoxide dismutase (SOD) activity and Acetylcholinesterase (AChE) activity was assessed 24 h post sepsis.

Results : Septic mice exhibited significant weight loss and impaired spontaneous locomotor activity compared to the control mice. Initially, minocycline did not attenuate the severity of weight loss (1 day) or locomotor activity impairment (4 hours post-sepsis), but it significantly accelerated the recovery of the mice in later days particularly in 25 and 50 mg/kg doses. Sepsis led

to elevated mRNA expression of IL-1β and TNF-α, and significant increase of MDA levels, and decreased thiol content and SOD activity 24 hours after sepsis induction. Minocycline dose-dependently mitigated brain inflammation and oxidative stress damage.

Conclusion : Our findings demonstrate that pretreatment with minocycline has the potential to prevent brain tissue damage and accelerate recovery from sepsis in mice, suggesting that minocycline may serve as a promising therapeutic intervention to protect against sepsis-induced neurological complications.

Keywords : Sepsis; Minocycline; Brain inflammation; Oxidative stress

Count: 354
Abstract ID: 57
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Effect of menthol on thioacetamide-induced neuroinflammation in the hippocampus

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Background and Aim : Neuroinflammation plays an essential role in the development and progression of various diseases in the nervous system. The aim of this research is to investigate the effect of the monoterpene menthol on the expression of inflammatory factors in the hippocampus of adult male rats receiving thioacetamide.

Methods : Adult male Wistar rats were subjected to intraperitoneal injection of thioacetamide (200 mg/kg) twice a week for one consecutive month. Menthol (40 mg/kg) was also injected intraperitoneally every day for one consecutive month. Then, the expression of inflammatory factors was measured by real-time PCR. Learning and spatial memory were also examined by the Morris water maze (MWM) test.

Results : The expression of tumor necrosis factor-alpha, interleukin (IL)-1beta, IL-6 and nuclear factor-kappa B significantly increased in the hippocampus of rats receiving thioacetamide, and menthol prevented the increase in the expression of all these factors. Thioacetamide and menthol treatment had no effect on the expression of IL-10 in the hippocampus. Furthermore, the administration of menthol to rats injected with thioacetamide significantly enhanced the duration spent in the target quadrant of the MWM.

Conclusion : It is concluded that menthol prevents thioacetamide-induced neuroinflammation in the hippocampus and improved spatial memory.

Keywords : Thioacetamide, Menthol, Hippocampus, Neuroinflammation, Memory

Count: 355
Abstract ID: 37
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Neurotoxicity in central nervous system hematologic disease associated CAR-T cell therapy

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Background and Aim : CAR-T cell therapy has created a great revolution in the treatment of many resistant and recurrent malignancies and is increasing. This method is one of the promising methods that works by directing T cells towards cancer. Due to its specific mechanism of action, CAR-T cell-based therapy has increased the range of neurotoxicities. CAR-T cell-related neurotoxicity, which was initially defined as CAR-T cell-related encephalopathy syndrome and is now called Immune effector cell-associated neurotoxicity syndrome, may be of concern.

Methods : This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords CAR-T cell therapy, neurotoxicity, neurological complications, 76 articles related to inclusion criteria were extracted and then analyzed.

Results : The results indicate that studies reported neurotoxicity after CAR-T cell treatment, and according to this case, there are 2 syndromes. Immune effector cell-associated neurotoxicity syndrome and cytokine release encephalopathy syndrome that the two may overlap. which can be accompanied by brain edema, lethargy, aphasia, seizure and stroke.

Conclusion : The evidence shows that involvement of the central nervous system in hematological diseases should not be considered as an absolute contraindication for CAR-T cell-based therapy. While its incidence may be high, it seems that its severity is significantly influenced by the state of the central nervous system.

Keywords : CAR-T cell therapy, neurotoxicity, neurological complications.

Count: 356
Abstract ID: 38
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The role of microRNA alterations in triggering inflammatory cascades related to Alzheimer's Disease pathogenesis

Submission Author: MohammadSaleh Safari

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Background and Aim : Alzheimer's disease is the most common cause of dementia in old age. Although research in the field of Alzheimer's disease has made important progress, its pathogenesis is not well known, and diagnostic biomarkers for Alzheimer's disease and specific treatment strategies are still lacking. Alzheimer's disease is characterized by hyperphosphorylation of tau protein, formation of alpha-beta senile plaques and neuroinflammation in the brain. microRNAs are a group of non-coding RNAs widely distributed in the central nervous system and play a role in pathogenesis through various mechanisms. The aim of this study is to review the inflammatory role of microRNAs changes in the pathogenesis of Alzheimer's disease.

Methods : This study is a review study by searching scientific databases such as Scopus, PubMed, Google Scholar, and Embase from 2016 to 2023 by using the keywords microRNA, Alzheimer's Disease, neuroinflammation, pathophysiology, 67 articles related to inclusion criteria were extracted and then analyzed

Results : The results indicate that changes in microRNAs play a role in the inflammatory response and cellular changes. MicroRNAs directly inhibit translation or directly degrade mRNA by specifically binding to the 3-prime untranslated region. Different microRNAs with wide

expression such as mir-146a, mir-155 have been shown to regulate the activation of microglia. mir-132, mir-126 show a progressive link with neuro-inflammatory signaling. Other pro-inflammatory and anti-inflammatory microRNAs are also effective on neuroinflammation.

Conclusion : : Changes in pro-inflammatory microRNAs increase the release of cytokines and the progression of Alzheimer's disease.The growing evidence shows that microRNAs play a role in neuroinflammation related to the progression of Alzheimer's disease. Also, the use of microRNAs can be useful as a diagnostic or therapeutic method for Alzheimer's disease.

Keywords : MicroRNA, Alzheimer's Disease, neuroinflammation, pathophysiology.

Count: 357
Abstract ID: 441
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Grafted Sertoli cells prevent neuronal cell death and memory loss induced by seizures

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Background and Aim : Epilepsy significantly reduces the patient's quality of life, and we still need to develop new therapeutic approaches to control it. Transplantation of cells such as Sertoli cells (SCs), having a potent ability to release a variety of growth and immunoprotective substances, have made them a potential candidate to deal with neurological diseases like epilepsy. Hence, this study aims to evaluate whether SCs transplant effectively protects the hippocampus astrocytes and neurons to oppose seizure damage.

Methods : For this purpose, the effects of bilateral intrahippocampal transplantation of SCs were investigated on the rats with the pentylenetetrazol (PTZ) induced seizure. After one-month, post-graft analysis was performed regarding behavior, immunohistopathology, and the distribution of the hippocampal cells.

Results : Our findings showed SCs transplantation reduced astrogliosis, astrocytes process length, the number of branches, and intersections distal to the soma of the hippocampus in the seizure group. In rats with grafted SCs, there was a drop in the hippocampal caspase-3 expression. Moreover, the SCs showed another protective impact, as shown by an improvement in pyramidal neurons' number and spatial distribution.

Conclusion : The findings suggested that SCs transplantation can potently modify astrocytes' reactivation and inflammatory responses.

Keywords : Sertoli cells · Pentylenetetrazol · Hippocampus · Astrocyte · Inflammation

Count: 358
Abstract ID: 444
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Tramadol induces apoptosis, inflammation, and oxidative stress in rat choroid plexus

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Background and Aim : The choroid plexus (CP) is the principal source of cerebrospinal fluid (CSF). It can produce and release a wide range of materials, including growth and neurotrophic factors which have a crucial role in the maintenance and proper functioning of the brain. Tramadol is a synthetic analog of codeine, mainly prescribed to alleviate mild to moderate pains. Nevertheless, it causes several side effects, such as emotional instability and anxiety.

Methods : In this study, we focused on alterations in the expression of inflammatory and apoptotic genes in the CP under chronic tramadol exposure. Herein, rats were treated daily with tramadol at 50 mg/kg doses for three weeks. CSF samples were collected, with superoxide dismutase (SOD) and glutathione (GSH) measured in the CSF.

Results : We found that tramadol reduced the SOD and GSH levels in the CSF. Furthermore, the stereological analysis revealed a significant increase in the CP volume, epithelial cells, and capillary number upon tramadol administration. Tramadol elevated the number of blob mitochondria in CP. Also, we observed the upregulation of inflammatory and apoptosis genes following tramadol administration in the CP.

Conclusion : Our findings indicate that tramadol induces neurotoxicity in the CP via apoptosis, inflammation, and oxidative stress.

Keywords : Superoxide dismutase · Glutathione · CSF; epithelial cells · Capillaries · Neurotoxicity

Count: 359
Abstract ID: 378
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The long term exposure of chlorpyrifos and hippocampal caspase 9 levels

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Background and Aim : Chlorpyrifos (CPF) is an organophosphate pesticide that was designed to kill insects. It acts on the nervous systems of insects. Many studies demonstrated several side effects of CPF on animals and human organs such as nervous system. Although the molecular mechanisms related to it are not fully understood. Therefore, the aim of present study was to investigate the effect of long term exposure to CPF on Caspase 9 level in hippocampus of rats.

Methods : Twenty-four male Wistar rats were randomly divided into four groups including control, sham, CPF 1mg/kg (CPF-1), and CPF 3mg/kg (CPF-3). The CPF was injected intraperitoneally (IP) for 6 weeks (5days/weeks). Data analysis were performed by, repeated measures ANOVA and post hoc Tucky test. The $P<0.05$ was considered to be statistically significant.

Results : Our results showed there were remarkable differences between control group and two other groups CPF-1 and CPF-3, respectively $P<0.01$ and $P<0.001$.

Conclusion : Our finding represented that long-term exposure with low doses of chlorpyrifos for about 6 weeks can increase the level of caspase 9 in the hippocampus, and can promote its toxic effects in the brain.

Keywords : Caspase 9, Hippocampus, Chlorpyrifos

Count: 360
Abstract ID: 326
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

staurosporine induced neurite outgrowth during Phosphoinositid signal pathway in PC12 cells

Submission Author: Hossein Zhaleh

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Background and Aim : In previous studies, we showed that staurosporine uses intracellular calcium ions to affect cell death in PC12 cells. The bulk release of intracellular excessive Ca2+ from intracellular sources into cytosol contributes to neuronal apoptotic events, which in turn results in neuronal cell death.

Methods : PC12 cells were preincubated with NMDA receptor inhibitors (1.8 mM ketamine) or/and L-Type Calcium channels (100 µM nifedipine and 100 µM flavoxate hydrochloride) or/and calcium-calmoduline kinasses (10 µM trifluoprazine). Then, the cells were cultured in RPMI culture medium containing 214nM staurosporine for induction of neurite outgrowth. The percentage of Cell cytotoxicity and apoptotic index was assessed. Total neurite length (TNL) and fraction of cell differentiation were assessed.

Results : The inhibition of phospholipase C or IP3 receptor antagonist or phosphoinositid signal transduction antagonist produced cell death and suppressed neurite outgrowth by staurosporine in PC12 cells. The inhibition of these enzymes and pathway results in an increase in intracellular Ca2+ although subsequent hydroxyl radical (•OH) production began after inhibitors exposure. •OH production was significantly attenuated in inhibitor supplemented medium treatment, and it was dependent on the intracellular Ca2+ concentration. These data indicate that staurosporine activates phosphoinositid signal pathway while endoplasmic Ca2+, and subsequent •OH production are critical events in staurosporine-induced neurite outgrowth in PC12 cells.

Conclusion : We conclude that the fact that staurosporine mobilizes Ca2+, probably via activating the subcellular compartment, is responsible for staurosporine-induced (Ca2+]i increase during neurite outgrowth in PC12 cells.

Keywords : Endoplasmic Reticulum, Neurite Outgrowth, Staurosporine, PC12 Cells

Count: 361
Abstract ID: 327
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Methamphetamine-induced cell cytotoxicity suppressed by Descurainia sophia oil in PC12

Submission Author: Hossein Zhaleh

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Background and Aim : Methamphetamine causes cytotoxicity and apoptosis in different cell lines. It seems that Descurainia sophia oil, as an East Asian folk herbal drug, can suppress the methamphetamine-induced cell death. In this study, protective effects of Descurainia sophia oil were followed up in methamphetamine-induced cell cytotoxicity in a neuron-like PC12 cell line.

Methods : The viability, proliferation, and cytotoxicity of the cells were assessed by Trypan blue, MTT test, and lactate dehydrogenase (LDH) assay, respectively. Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) test was performed to detect DNA fragmentation and apoptosis. Nitric oxide (NO) level was detected by Griese method. Interleukin-1β (IL-1β), IL-6, interferon gamma (INF-γ), and tumor necrosis factor alpha (TNF-α) pro-inflammatory cytokines were measured by Rat Kit V-Plex, and finally, caspase-3 activity was determined by spectrophotometry.

Results : Results showed that Descurainia sophia oil has cell death–suppressing effects on PC12 cells. It enhanced the cell viability and proliferation and also increased the cell cytotoxicity and cell death index in methamphetaminetreated PC12 cells. Also, it suppressed NO production, inflammatory cytokine production by flow cytometry, mitochondrial membrane depolarization, and caspase-3 activity in a dose-dependent manner.

Conclusion : We concluded that Descurainia sophia oil suppresses the methamphetamine-induced cell death in PC12 cell due to reduction of NO production, inflammation, and inhibition of apoptosis cascade.

Keywords : Descurainia Sophia, Methamphetamine, Cell cytotoxicity, Cell death, PC12 cells

Count: 362
Abstract ID: 149
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

The Aβ neurotoxicity and the main regulatory enzyme of melatonin synthesis in pinealectomized rats

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Background and Aim : In addition to the pineal gland, melatonin production has been observed in various extra-pineal sites, including the hippocampus. In these extra-pineal locations, melatonin serves not only as an endocrine hormone but also as an intracellular mediator or a paracrine signal, exerting its effects locally. The aim of the study is to investigate how a single injection of beta-amyloid affects the activity of the main regulatory enzyme in melatonin synthesis, known as arylalkylamine N-acetyltransferase (AANAT), in the hippocampus of rats that have undergone pinealectomy.

Methods : In this experiment, 60 adult rats underwent pinealectomy (PIN×) surgery. Following the PIN× surgery, amyloid-beta was administered bilaterally in the hippocampus. After 24 hours, hippocampal tissue was collected for analysis. Immunohistochemical staining of tumor necrosis factor-alpha (TNF-α) was performed to investigate neuroinflammation. The activity of the AANAT enzyme was measured using the western blotting method.

Results : 24 hours following the amyloid-beta injection, there was a noticeable increase in the region displaying positive staining for TNF-?, which suggests the presence of inflammation. The presence of PIN× alone did not influence the activity of AANAT in the hippocampus. Additionally, there were no significant alterations observed in the activity of hippocampal AANAT in the PIN× groups vs PIN×+A? groups.

Conclusion : Pinealectomy alters the inflammatory response threshold, as evidenced by reduced TNF-α positive area in the PIN× group compared to the PIN×+Aβ group. Further investigation is needed to determine the impact on AANAT enzyme metabolism and reabsorption. The hippocampus appears to employ a protective mechanism by maintaining the enzyme activity at baseline levels. This suggests an attempt to safeguard against potential disruptions or imbalances

Keywords : Pinealectomy, Arylalkylamine N-Acetyltransferase, neurotoxicity, amyloid-β, Hippocampus

Count: 363
Abstract ID: 146
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Tenecteplase administration for Acute Ischemic Stroke

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Background and Aim : Intravenous thrombolysis with recombinant tissue plasminogen activator (rtPA) is the primary treatment for ischemic stroke. Alteplase is an approved thrombolysis therapy for more than two decades. Tenecteplase is a new variant of tissue plasminogen activator (tPA) that has been reported to have beneficial effects in recent years. The aim of this study is to investigate the effectiveness and the side effects of tenecteplase in the ischemic stroke.

Methods : Here we administrated 0.25 mg/kg tenecteplase in 36 patients with acute ischemic stroke within 4.5 hours after the stroke onset. The NIHSS in baseline, 24 hours and 7 days later and the modified Rankin scale(mRS) at 90 days were assessed. The primary efficacy outcome was reduction of at least 4 point in the NIHSS during 7 days and the secondary efficacy outcome defined as the mRS 0 and 1 at 90 days. The safety outcome was evaluated by the rate of symptomatic intracranial hemorrhage (ICH) and mortality during 90 days.

Results : The mean NIHSS at baseline was 12.7±4.6, and the mean NIHSS corresponding to 24 hours after admission was 9.6±4.8. The mean 7-day NIHSS was 7.6±4.4. The primary and secondary efficacy outcomes were met in 18 (50%) and 22 (61.1 %) of the patients respectively. Symptomatic ICH was seen in one patient with lung cancer who died of respiratory failure.

Conclusion : The outcomes of this study confirmed the efficacy and safety of tenecteplase in ischemic stroke treatment. Tenecteplase appears to be an appropriate option for the stroke thrombolysis.

Keywords : Tenecteplase, Ischemic Stroke, Thrombolysis, Alteplase, Tissue Plasminogen Activator.

Count: 364
Abstract ID: 199
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Neural stem cell (NSCs) delivery by biomaterials: new modality for stroke therapy

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Stroke is the second leading cause of death and disability in the world, and its prevalence is rising in developing nations. Most strokes are ischemic in nature and are brought on by arterial occlusion. With intravenous thrombolysis and endovascular thrombectomy, which both reduce disability but are time-critical, the goal of treatment is rapid reperfusion. To maximize the advantages of reperfusion therapies, the healthcare system must be improved to decrease treatment delays. As known, the vast majority of the nervous system's primitive and uncommitted cells, known as neural stem cells (NSCs), are thought to be the source of the many specialized cell types of peripheral nervous system (PNS) and central nervous system (CNS). After being injected into preclinical animal models of stroke, NSCs have shown multimodal therapeutic function. The central nervous system can be used to isolate human NSCs, or pluripotent stem cells can be used to generate human NSCs in a laboratory setting. NSCs are able to protect at-risk neural cells, encourage endogenous NSC proliferation and migration, foster synaptic remodeling, stimulate the formation of new blood

vessels, and/or integrate into host neural circuits, all of which have been linked to enhancements in cognitive and sensorimotor function. Although NSC-based therapy has a lot of potential, but in vivo studies have generally shown that it has limited therapeutic efficacy. The fact that the transplanted NSCs significantly lose viability after transplantation serves essential role in this regard. Injured or damaged tissues present unfavorable environments for cell growth, such as reactive oxygen species and the host's immune responses. Also, the lack of cell-supporting signals around the transplanted NSCs leads to the eventual death of the transplanted cells. Also, extracellular matrix (ECM) destruction resulting from ischemic damage has substantial negative influences on NSCs' biological performances. As a result, many studies have focused on stem cell transplantation with substances that can support cell survival, induce their bioactivity, and enhance cell retention at the administered sites. In light of this, NSCs delivery using biomaterials has attracted increasing attention. Neuritis outgrowth, human NSCs differentiation, and nerve gap bridging are just a few of the neural tissue engineering outcomes that biomaterials, both natural and synthetic, have continuously demonstrated. As NSC delivery vehicles, biomaterials can facilitate host cell recruitment and differentiation while providing cells with physical support and protection. Furthermore, biomaterials derived from natural sources expose substantial intrinsic bioactivity that may facilitate tissue integration. In the current review, we have focused on the therapeutic capabilities of NSCs therapy in combination with biomaterial to bring about more desired effects in stroke patients.

Keywords : Neural stem cell, Neurogenesis, Stroke, Transplantation, Biomaterials

Count: 365
Abstract ID: 134
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Adipose-derived mesenchymal stem cells reduced transient cerebral ischemia injury by modulation of inflammatory factors and AMPK signaling

Submission Author: Reyhaneh Vali

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Background and Aim : Stem cell-based treatments have been recommended as a feasible therapy for stroke victims due to their potential for angiogenesis, neurogenesis, and synaptic plasticity. The intracellular mechanisms of stem cells against cerebral hypoperfusion are not well recognized.

Methods : In this study, by releasing the clips, the reperfusion period was extended to 96 h, and two hours after cerebral ischemia, animals received adipose-derived MSCs. MSCs were isolated from the inguinal fat pads of rats and injected into two-vessel occlusion (2VO) rats 1 h after ischemia induction. Ninety-six hours after 2VO induction, behavioral and molecular tests were assessed.

Results : Adipose-derived MSCs treatment improves neurological scores, passive avoidance memory, and novel object recognition tests in the 2VO model compared to 2VO rats ($P < 0.001$). MSCs treatment decreased TNF-α ($P < 0.01$) and IL-6 ($P <0.01$) and apoptotic factors (Bax/Bcl-2 ratio and caspase-3 level ($P < 0.01$)) compared with ischemic rats. MSCs treatment of ischemic rats could enhance Klotho-α and AMPK-α compared with ischemic rats ($P < 0.001$).

Conclusion : The study disclosed that adipose-derived MSCs could improve neurological damage and memory deficits by reducing neuronal death in cerebral ischemia. Data proposed that adipose-derived MSCs inhibit pro-inflammatory factors such as IL-6 and TNF-α, consequently decreasing apoptosis in the hippocampus of CCAO rats. Besides, the Klotho-α and AMPK-α measurements found that MSCs might induce intracellular neuroprotective pathways via activation of Klotho-α/AMPK-α signaling.

Keywords : Mesenchymal stem cells, Cerebral ischemia, Inflammation, Memory, AMPK, Apoptosis

Count: 366
Abstract ID: 298
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Investigating the effect of different doses of valproic acid on cellular and tissue changes in the hippocampal CA1 region in the focal ischemia model in male rats.

Submission Author: Samaneh Seyedi

Samaneh Seyedi[1], Ghorbangol Ashabi[2]

1. -
2. amaneh Seyedi1 (M.Sc), Saereh Hosseindoost (PhD)2, Esmail Riahi1 (PhD), Mahdi Hajiaqaei1 (PhD candidate), Ghorbangol Ashabi1 (PhD)

Background and Aim : : Stroke is considered as the second leading cause of disability and death worldwide and imposes huge economic costs on health systems. Some of the mechanisms involved in this pathological state are: Overexcitation of neurons, occurrence of oxidative stress and neuronal inflammation. As mentioned, it seems that due to the fact that one of the causes of acceleration of the stroke mechanism is high neuronal excitability, therefore, the use of certain drugs such as voltage-dependent sodium channel inhibitors is considered effective in the treatment of stroke. Valproic acid (VPA), which is known as one of the most effective antiepileptic drugs (AEDs), has presynaptic and postsynaptic effects and can regulate ion currents. therefore, VPA plays a very important role on the excitability of neurons.

Methods : At first, the animals were randomly divided into 3 groups. Group one: focal ischemia, group two: focal ischemia + dose (10 mg/kg) of valproic acid and group three: focal ischemia + dose (50 mg/kg) of valproic acid. To create focal ischemia in the CA1 region of the hippocampus, we placed a filament in the internal carotid for one hour, then removed. After four hours, we injected doses of (10 mg/kg) and (50 mg/kg) valproic acid into the animals as Tail vein injections and after two hours, we removed the hippocampus tissue for cellular and molecular analysis.

Results : The number of hippocampal CA1 neurons in the group of focal ischemia + dose (10 mg/kg) of valproic acid increased significantly compared to the group of focal ischemia + dose (50 mg/kg).

Conclusion : GABA receptors is dose dependent and time dependent, and following the injection of a dose (50 mg/kg) of valproic acid, instead of entering the neurons and causing hyperpolarization, the chloride flow leaves the cells and depolarizes the cells. It makes the situation worse.

Keywords : GABA receptors ,focal ischemia ,Valproic acid (VPA) ,stroke

Count: 367
Abstract ID: 54
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The impact of Chrysin and Gallic acid on blood-brain barrier integrity and expression of claudin-5 in a rodent model of cerebral ischemia

Submission Author: Shahein Momenabadi

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Background and Aim : This study aimed to examine the impact of Chrysin, a natural flavonoid, and Gallic acid (G.A), a natural polyphenolic, on the blood-brain barrier (BBB) integrity and the expression of claudin-5 in a rodent model of cerebral ischemia

Methods : Cerebral ischemic was induced through 30-minute bilateral common carotid occlusion (BCCO) and 48 hours of reperfusion. Chrysin (30 mg/kg, IP) and G.A (50 mg/kg, IP), and their combination, were given at the beginning, 30 minutes, and 1 hour after reperfusion. After 48 hours of reperfusion, the integrity of the BBB was assessed using Evan's blue dye, and the expression of claudin-5 was evaluated through immunohistochemistry.

Results : The extravasation of Evan's Blue dye into brain tissue significantly increased 48 hours after the ischemia-reperfusion ($p < 0.001$). The administration of Chrysin, Gallic acid (G.A), and their combined treatment led to a noteworthy reduction in Evan's Blue leakage into brain tissue ($p < 0.001$). Additionally, this intervention markedly elevated the expression of claudin-5 in the brain ($p < 0.001$).

Conclusion : Chrysin and its combination with G.A. protected the integrity of the BBB by upregulating the expression of claudin-5. We suggest that this approach may potentially benefit stroke patients, but more research is required to validate its effectiveness.

Keywords : Chrysin, Gallic acid, Combination, Brain ischemia, BBB integrity, Mice

Count: 368
Abstract ID: 55
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Exploring the impact of the combination of Chrysin and Gallic acid on hippocampal neuronal damage and spatial memory in a mouse model of cerebral hypoperfusion

Submission Author: Ali Vakili

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Background and Aim : This research aims to examine the impact of the simultaneous administration of Chrysin, a natural flavonoid, and Gallic acid (G.A), a natural polyphenolic, on the hippocampal neuronal damage, behavioral performance in a mouse model of cerebral hypoperfusion.

Methods : In this experimental research cerebral ischemia was created by 30-minute bilateral common carotid occlusion (BCCO) and 48 hours of reperfusion. Chrysin (30 mg/kg, IP) and G.A (50 mg/kg, IP), and their combination, were given at the beginning, 30 minutes, and 1 hour after reperfusion. At 48 hours after reperfusion, neuronal injury was assessed in the CA1, CA3, and dentate gyrus (DG) regions of the hippocampus using H&E staining, as well as spatial memory by the radial arm water maze (RAWM).

Results : Our data indicated that treatment with the combination of Chrysin and G.A resulted in the enhanced of surviving neuronal cells in the CA1, CA3, and D.G. regions of the hippocampus ($P<0.001$). It also reduced neurological and spatial memory dysfunctions ($P<0.01$).

Conclusion : The combined intervention of Chrysin and G.A synergistically protects the brain from ischemic injury and improves behavioral outcomes. This approach holds promise for potential benefits in stroke patients, but further research is necessary to definitively confirm its effectiveness.

Keywords : Chrysin, Gallic acid, Combination, Brain ischemia, hippocampus injury, Spatial memory, Mice

Count: 369
Abstract ID: 222
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Ischemic Postconditioning increased hippocampal Brain-Derived Neurotrophic Factor led to Attenuate Bilateral Renal Ischemia-induced Cognitive Impairments

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Background and Aim : Acute Kidney Injury (AKI) is a frequent complication of kidney failure with high mortality, leading to brain dysfunction. Cognitive changes following renal disease have been demonstrated recently. Several studies introduced Ischemic post-conditioning (IPo) as a new neuroprotective strategy to deal with Ischemic re-perfusion injury. This study aimed to investigate the possible protective effect of IPo against brain dysfunction induced by Bilateral Renal Ischemia (BRI).

Methods : Adult male Wistar rats (8–10 weeks old, 180–220 g) underwent BRI, sham, or IPo surgery 24h and 1w after re-perfusion. The rats subjected to Bilateral BRI were divided into 2 groups of n=10, in which the right and left renal arteries and veins were occluded for 1h that followed by the re-perfusion periods of 24 hours (BRI-24h group) and 1 week (BRI-1w group). The sham-operated rats were divided into 2 groups of n=10 that animals underwent only anesthesia without occlusion with periods equivalent to reperfusion of 24 hours (sham-24h group) or 1 week (sham-1w group). IPo animals were also divided into 2 groups (n=10/group) subjected to 60 min ischemia, then 3 cycles of 10s of re-perfusion followed by 10s ischemia in the re-perfusion periods of 24 hours (IPo-24h group) and 1 week (IPo-1w group). The rats' explorative behaviors and motor function were evaluated by an open field, rotarod, and wire grip tests. The cognitive function was

assessed by passive avoidance learning and Morris water maze tests. Western blotting was performed to evaluate hippocampal Brain-Derived Neurotrophic Factor (BDNF) expression. Behavioral assays were performed 24h or 1 week after surgery with a 2h interval among each assay in the following order: open field test, rota-rod, wire grip test, and shuttle box or Morris water maze (the last two assays were performed in separate groups of study due to the nature of the procedure).

Results : The impairment of balance function induced by BRI was not reversed; however, passive avoidance learning impairment was reversed by post-conditioning 24h after re-perfusion. IPo increased muscle strength compared to the BRI group; however, explorative behaviors and balance function had no difference 1w after re-perfusion. BRI significantly decreased the BDNF protein expression in the hippocampus, and post-conditioning increased 24h after re-perfusion.

Conclusion : The current study results suggested that AKI triggers distant organ dysfunction led to the deleterious effect of BRI on cognitive and balance function 24h after re-perfusion and post conditioning protects some aspects of brain function, as a remote organ from the renal ischemia re-perfusion injury. These beneficial effects of post conditioning against IR-induced memory impairment may be associated with preventing IR-induced hippocampal BDNF down-regulation. Moreover, the present study adds to the literature supporting the concept that modifying re perfusion conditions at the early moments may be a valuable strategy to reduce injuries induced by ischemia re-perfusion.

Keywords : Cognitive impairments, Acute kidney injury, Postconditioning, Brain-derived Neurotrophic Factor, Bilateral renal ischemia

Count: 370
Abstract ID: 551
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Design, synthesis, and biological evaluation of coumarin-chalcone hybrid derivatives with antioxidant and neuroprotective properties in in-vitro, in-vivo, and in-silico models of cerebral ischemia

Submission Author: Maryam Mohammadnia

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Background and Aim : After a cerebral ischemia-reperfusion, one of the most important clinical states is oxidative stress, which affects different parts of the brain in different ways based on how sensitive they are to oxygen deficiency. Even though this illness has been known for a long time, it has taken until today for a specific treatment method to be added to global guidelines. Therefore, studies and research are still going on to find a strong antioxidant drug

Methods : Our attempts to design and synthesize new molecules based on natural compounds, hybridization of effective molecules, and study of the molecular model for binding to the receptor that leads to the triggering of oxidative stress pathways led to the creation of a class of derivatives that has a very powerful effect on reducing oxidative stress.

Results : In this study, a new class of derivatives was made by combining chalcones and coumarins, both of which have been shown to have antioxidant properties. Compounds 7f, 7j, and 7l in this series were able to counteract the effect of oxidative stress caused by H2O2 on cultured hippocampal neurons and significantly increased cell viability. Compound 7l was also effective in

an animal model of cerebral ischemia-reperfusion injury. In behavioral tests such as open-field, EPM and novel-object rats in the treatment group showed a significant change compared to the control group.

Conclusion : In general, both in vitro and in vivo tests show that compound 7l can be used to treat brain ischemia-reperfusion damage as a strong antioxidant that protects neurons and cells.

Keywords : Cerebral Ischemia-Reperfusion; Oxidative stress; Chalcone; Coumarin; Anti-oxidant

Count: 371
Abstract ID: 598
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Evaluation of anxiety-like behavior in MCAO model rat treated with Bacteroides fragilis outer membrane vesicles (OMVs)

Submission Author: Fatemeh Mirzakhani

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Background and Aim : Ischemia and stroke are one of the most important causes of death in the world. Ischemia can be classified as a neurodegenerative disease and the possibility of ischemia increases with age. However, there is still no definitive treatment for this disease, and the identification of new strategies for the prevention and treatment of stroke is of great interest in the world. Recently, the role of gut microbiota and its metabolites in the pathogenesis of stroke has been noticed. The change in gut microbiota population in connection with the effect on gut-brain bidirectional axis increases the possibility of stroke. In this study, we examined the impact of Bacteroides fragilis outer membrane vesicles (OMVs) on anxiety-like behavior in MCAO (Middle Cerebral Artery Occlusion) model rat.

Methods : The rats (n=24) were divided into three groups (Scheme, MCAO and MCAO + B. fragilis OMVs). They orally received PBS and B. fragilis OMVs for five days Respectively. After the treatment period, the rats underwent Open Field test (OF) to assess anxiety-like behavior. Finally, the results were analyzed using SPSS_24 program and kruksal wallis method.

Results : Data showed that center occupancy in OF decreased in MCAO group compared to scheme group ($p<0.001$). The center occupancy increased in MCAO + B. fragilis OMVs in

comparison to MCAO group ($p<0.001$). Therefore, the anxiety dexreased in MCAO + B. fragilis OMVs group compared to MCAO group significantly.

Conclusion : It has been established that B. fragilis OMVs directly influence on anxiety in stroke patients. Many studies have demonstrated relationship between stroke and anxiety that the population of gut microbiota and its metabolites can have different effects on it.

Keywords : MCAO Microbiota ischemia anxiety

Count: 372
Abstract ID: 412
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Beneficial Effects of Japanese Sake Yeast on Anxiety-Like Behaviors, BDNF levels and mRNA expression of TNF-α and IL-6 in a Preclinical Model of Global Cerebral Ischemia/Reperfusion

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Background and Aim : Stroke is a serious cerebrovascular disease that causes post-stress depression and death. Natural agents are more efficient for the treatment of stroke due to lower toxicity and their pharmaceutical properties. Sake yeast is an antioxidant compound that could be used to treat stroke and post-stress depression. Given the importance of effective therapeutic ways to overcome stroke-related deficits, the present study investigated the effects of Japanese sake yeast on anxiety-like behaviors, BDNF levels and inflammatory parameters in a rat model of global cerebral ischemia/reperfusion.

Methods : Rats were divided into four groups, including 1) control: without bilateral common carotid artery occlusion (BCCAO), 2) Ischemia group: rats induced with BCCAO and lack of therapeutic supplement, and 3 and 4) Ischemia + sake groups: rats induced with BCCAO and treated with 25 and 50 mg/kg sake yeast, respectively. Sake yeast administrated daily by oral gavage for 28 days. Subsequently, anxiety and depression-like behaviors, the concentrations of brain-derived neurotrophic factor (BDNF), and mRNA expression of TNF-α and IL-6 in the prefrontal cortex (PFC) were assessed.

Results : The results showed that induction of stroke increased anxiety and depression-like behaviors in rats and treatment with sake yeast could alleviate these behaviors. The rats treated with a 50 mg/kg supplement produced lower anxiety and depression-like behaviors than those administered with a 25 mg/kg supplement ($P<0.001$). Additionally, stroke significantly decreased

BDNF and increased mRNA expression of TNF-? and IL-6 in the PFC. Sake yeast significantly increased BDNF levels and decreased inflammatory parameters in the PFC.

Conclusion : The findings of the present study provide important evidence for the development of new pharmacological and therapeutic ways to prevent the adverse effects of stroke against behavioral and neurobiochemical deficits. The sake yeast could be used as a supplement in combination with other drugs to treat stroke.

Keywords : BDNF, Anxiety-like behaviors, Sake yeast, Ischemia, Rat model

Count: 373
Abstract ID: 419
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Investigating of the effect of minocycline on the behavioral-cognitive disorders induced by global cerebral ischemia

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Background and Aim : Stroke is one of the most important causes of death and disability in the world, so a lot of researches are being done to treat it. From these researches, it can be pointed out the expansion of the use of neuroprotective drugs, which aim to reduce cell death and the volume of stroke, after it occurs and minocycline could potentially be one of them. Minocycline, under trade name of Minocin, is a tetracycline antibiotic used to treat a number of bacterial infections, such as pneumonia.

Methods : Rats (200-250 gr) were used randomly in the groups (N=7) including: 1) control 2) sham 3) surgery 4) surgery + solvent + ischemia 5) surgery + ischemia and 6) minosycline groups of 11.25, 22.5 and 45mg/kg). The global ischemia was induced by surgery and blocking the carotid arteries for 20 minutes, then 30 minute after the completion of the surgery, intraperitoneally (i.p) injection was employed for treating the solvent or drug at the day zero, then the injections were performed for 7 constitutive days at the same day time, then on the day eighth, anxiety behavior was checked using open field apparatus and short-term memory by Y-Maze.

Results : Surgery without ischemia induction, increased the anxiety behavior compared to the sham and control groups ($P < 0.05$), it was also found that the induction of ischemia significantly increased anxiety behavior ($P<0.0001$), minocycline i.p doses of 11.25 mg/kg and 22.5 mg/kg could not significantly reduce anxiety but the dose of 45 mg/kg was significantly able to decrease the amount of anxiety, compared to the groups of (solvent + ischemia + surgery) and (ischemia+ surgery) ($P<0.001$). Using Y-maze test, it was found that the solvent has no effect on short-term memory even after it was impaired after global ischemia surgery. Also, the surgical process without ischemia induction has no effect on short-term memory, but it was found that the global

brain ischemia induction was significantly able to cause dysfunction in short-term memory ($P<0.0001$), while minocycline at the i.p. dose of 11.25 mg/kg had no effect, both the minocycline i.p. doses of 22.5 ($p<0.05$) and 45 mg/kg ($p<0.001$) improved the short-term memory impairment induced by ischemia ($P < 0.001$).

Conclusion : Minocycline is a lipophilic molecule and can easily penetrate the blood-brain barrier and also because of its capability to reduce oxidative damage and inflammation, minocycline in the present study probably has been able to reduce the damage caused by cerebral inflammation during ischemia/reperfusion and showed it's cognitive repairment potential during the experiments.

Keywords : Global cerebral ischemia, Minocycline, open field, short-term memory, y-maze

Count: 374
Abstract ID: 396
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

The effect of nanometformin on the hippocampal CA1 neurons after cerebral ischemia due to transient bilateral occlusion of common carotid arteries in rat

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Background and Aim : Stroke is the third leading cause of death and the main cause of disabilities (such as paralysis, ataxia, paresthesia and aphasia) in adults. Worldwide, stroke kills about 4.4 million people per year. Furthermore, the incidence of stroke is expected to increase continuously as life expectancy increases. Although medical care has significantly reduced the number of deaths from stroke in recent decades, it has led to an increase in the number of stroke survivors who experience life-long disability. The hippocampus region is damaged, and consequently the CA1 region, which is the most sensitive region to ischemia. In the present study, we intend to investigate the protective effect of metformin nanoparticle (SLN) on the neurons of this region, following ischemia.

Methods : In this study, about 60 male rats were used in seven groups (Intact, Sham, Vehicle, and nanoparticle solvent, and 3 groups receiving metformin nanoparticles with doses of 5, 10, and 20 mg per kilogram of weight) 6-8 Tai were present. After preparing rats and inducing ischemia with carotid artery occlusion, brain water content, neurological score with Baderson rating, Morris blue maze test, shuttle box test and the amount of interleukins 10 and 1-beta were determined. The data was analyzed by Prism8 GraphPad software.

Results : After analyzing the data, it was found that in the groups receiving metformin nanoparticles with doses of 5 and 10 mg/kg compared to the control group, brain water content, neurological score, Morris blue maze test indices, presence in the dark room and the level of

interleukins 10 and 1-beta have had significant changes in the direction of improvement ($P<0.05$ and $P<0.01$, respectively). The group receiving SLN metformin with a dose of 20 mg/kg had no significant changes in the investigated parameters ($P>0.05$).

Conclusion : In the conducted investigations, we came to the conclusion that metformin SLN can prevent various brain injuries caused by stroke and even improve them in some cases, thus exerting its neuroprotective effect. In the present study, we showed that the reduction of inflammatory factors such as IL-1β and, on the contrary, the increase of anti-inflammatory cytokines such as IL-10 can be an important factor in the protective role of metformin SLN on the CA1 area of the hippocampus.

Keywords : Metformin nanoparticle, cerebral ischemia, neuroprotection, interleukins, rat

Count: 375
Abstract ID: 240
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Cerebrolysin and Environmental Enrichment attenuate on Hippocampal Oxidative Stress Status and Neuroinflammation in Post-Ischemic Depression Model in Mice

Submission Author: SeyedZanyar Athari

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Background and Aim : Global cerebral ischemia (GCI) involves various pathological events, like elevated reactive oxygen species and inflammatory cytokines, as well as reduced brain-derived neurotrophic factor (BDNF). GCI is frequently accompanied by psychiatric disorders, such as post-ischemic depression (PID) and anxiety, due to the vulnerability of regions like the hippocampus (HIP) to ischemic insults. To enhance the outcomes of cerebral ischemia, a suitable combination therapy is needed to address both the primary symptoms and associated complications like depression. Cerebrolysin (CBL) is a combination of free amino acids and neuropeptides, such as BDNF and nerve growth factor. It offers neuroprotection against neurodegenerative conditions by preventing free radical formation, reducing inflammation, inhibiting excitotoxicity, and enhancing cerebral blood flow (CBF). The combination of social stimulus and inanimate objects in environmental enrichment (EE) shows positive effects on restoring cognitive outcomes in global and focal cerebral ischemia models. Furthermore, the influence of EE on corticosterone levels, brain BDNF signaling, and neuroinflammation could lead to improvements in stress, anxiety, and depression. Consequently, this study aimed to examine how CBL and EE, separately or in combination, affect behavioral changes, oxidative stress levels, and neuroinflammation in the HIP of a mouse model with PID.

Methods : In the study, 60 male Balb/c mice weighing 25-30 were randomly divided into Sham surgery or ischemic stroke groups. To induce global ischemia in the ischemic animals, transient occlusion of the bilateral common carotid artery (bCCAO) was performed twice for 5 min, with a

10-min interval. The animals in the Sham group were subjected to sham surgery and received normal saline treatment for 14 days. To induce the PID model, the ischemic group was subjected to spatial restraint stress (2 h/day) for two weeks, 48 h after the bCCAO model was established. Subsequently, the animals received their respective interventions for 14 days: NS group (i.p. injection of 1 ml/kg normal saline), CBL group (2.5 ml/kg/day CBL i.p.), EE group (transferred to the EE for 2 h/day), and CBL+EE group (combination of CBL injection and housing in the EE). The day after the last experiment, we assessed anxiety- and depressive-like behaviors and sociability. Serum corticosterone level and the amount of hippocampal superoxide dismutase (SOD), glutathione peroxidase (GPx), total antioxidant capacity (TAC), and malondialdehyde (MDA) were measured at the end of the study. Moreover, protein expression of NF-kB, Iba-1, BDNF, and CREB were measured using immunoblotting.

Results : The results showed that treatment involving CBL and EE, either alone or together, led to a decrease in anxiety and depression-like behaviors, as well as an improvement in social behavior in PID animals. The behavioral changes were accompanied by a decrease in serum corticosterone levels and lipid peroxidation, as well as an increase in endogenous antioxidant enzyme activities. Furthermore, CBL and EE effectively boosted the BDNF/CREB pathway while suppressing neuroinflammatory responses in the HIP.

Conclusion : By targeting multiple biological factors, including the HPA axis, oxidative stress, neuroinflammation, and BDNF/CREB pathway, CBL and EE showed promise in mitigating anxiety and depression-like behaviors, and improving social behaviors in the PID model.

Keywords : Post-ischemic depression; Cerebrolysin; Enriched environment; Oxidative stress; Neuroinflammation

Count: 376
Abstract ID: 235
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

G-CSF improved the memory and dendritic morphology impairments in the hippocampal CA1 pyramidal neurons after brain ischemia in the male rats

Submission Author: Mohammed Reza Naghdi badi

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Background and Aim : Stroke remains the leading cause of death and disability in the world. A new potential treatment for stroke is the granulocyte colony-stimulating factor (G-CSF), which exerts neuroprotective effects through multiple mechanisms. Memory impairment is the most common cognitive problem after a stroke. The suggested treatment for memory impairments is cognitive rehabilitation, which is often ineffective. The hippocampus plays an important role in memory formation. This project aimed to study the effect of G-CSF on memory and dendritic morphology of hippocampal CA1 pyramidal neurons after middle cerebral artery occlusion (MCAO)in rats.
Methods : Male Sprague-Dawley rats were divided into three groups: the sham, control (MCAO + Vehicle), and treatment (MCAO + G-CSF) groups. G-CSF (50 µg/kg S.C) was administered at 6, 24, and 48 h after brain ischemia induction. The passive avoidance task to evaluate learning and memory was performed on days 6 and 7 post-ischemia. Seven days after MCAO, the brain was removed and the hippocampal slices were stained with Golgi. After that, the neurons were analyzed for dendritic morphology and maturity.
Results : The data showed that stroke was associated with a significant impairment in the acquisition and retention of passive avoidance tasks, while the G-CSF improved learning and memory loss. The dendritic length, arborization, spine density, and mature spines of the hippocampus CA1 neurons were significantly reduced in the control group, and treatment with G-CSF significantly increased these parameters.
Conclusion : G-CSF, even with three doses, improved learning and memory deficits, and dendritic morphological changes in the CA1 hippocampal neurons resulted from brain ischemia.
Keywords : CA1; Dendritic arborization; G-CSF; Memory; Neuronal plasticity; Sholl analysis; Stroke.

Count: 377
Abstract ID: 608
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The effect of Escherichia coli outer membrane vesicles (OMVs) on anxiety-like behavior in focal cerebral ischemial model.

Submission Author: Erfan Soroush

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Background and Aim : Stroke or cerebral ischemia is the third cause of death in developed countries. About 85% of strokes are caused by ischemia. The most cerebral ischemia damage occurs during blood reperfusion. Today, many studies have been conducted to prevent ischemia or treat it, but its definitive treatment has not yet been found. Recently, the role of gut microbiota in neurodegenerative diseases has attracted the attention of researchers. This bacterial population is disrupted under the influence of various factors, which is directly related to the progress and pathogenesis of various diseases. Gut microbiota and its metabolites have significant effects on disorders such as depression and anxiety through the gut-brain axis. In this study, we examined the impact of Escherichia coli outer membrane vesicles (OMVs) on anxiety-like behavior in MCAO (Middle Cerebral Artery Occlusion) model rat.

Methods : The rats (n=24) were divided into three groups (Scheme, MCAO and MCAO + E. coli OMVs). They orally received PBS (MCAO) and E. coli OMVs (MCAO + E. coli OMVs) for five days respectively. After the treatment period, the rats underwent novel object test (NO) to assess anxiety-like behavior. Finally, the results were analyzed using SPSS_24 program and kruksal wallis method.

Results : Data showed that discrimination index in NO decreased in MCAO group compared to scheme group ($p<0.001$). The discrimination index increased in MCAO + E. coli OMVs in comparison to MCAO group ($p<0.001$). Therefore, the anxiety decreased in MCAO + E. coli OMVs group compared to MCAO group significantly.

Conclusion : It has been established that E. coli OMVs directly influence on anxiety in stroke patients. Many studies have demonstrated relationship between stroke and anxiety that the population of gut microbiota and its metabolites can have different effects on it.

Keywords : MCAO Microbiota ischemia anxiety Escherichia coli

Count: 378
Abstract ID: 467
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Investigation of the effect of Itaconic acid on behavioral disorders induced by global cerebral ischemia/reperfusion

Submission Author: Zahra Delavari

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Background and Aim : Today, stroke is known as a major global problem. Whole-body ischemia: Occurs when blood flow to the entire brain is stopped or severely reduced, usually caused by cardiac arrest. Itaconic acid is an organic unsaturated dicarboxylic acid. For a long time, it was believed that itaconic acid is exclusively synthesized in prokaryotes and fungi. However, recent decades have shown that itaconic acid is activated by macrophages in response to inflammations such as those caused by bacterial infections.

Methods : Global ischemia was induced in the Rat (200-250 g, n=7 each group, including: 1) control, 2) sham, 3) surgery, 4) surgery + solvent + ischemia, 5) surgery + ischemia and 6) the Itaconic acid groups of 12.5, 25 and 50 mg/kg), by surgery and carotid artery occlusion for 20 minutes, then after about 30 minutes, solvent or drug was injected intraperitoneally (i.p.) at the day zero and continued for 7 constitutive days at the same day time, then on the eighth day, open field tests were performed to check anxiety behavior and Y-maze to check short-term memory.

Results : In the open field, it was found that surgery increases the anxiety behavior compared to the sham and control groups ($P < 0.05$). It was also found that the induction of ischemia significantly increased anxiety ($P<0.0001$), i.p. doses of 12.5 and 25 mg/kg of Itaconic acid could not significantly reduce anxiety, but the dose of 50 mg/kg could significantly reduce the anxiety in comparison to the groups (solvent + ischemia + surgery) and (surgery + ischemia) ($P<0.001$). In the Y-maze test, the process of ischemia/reperfusion significantly impaired short-term memory performance ($P<0.0001$) but surgical process without ischemia/reperfusion had no effect on short-term memory and also solvent didn't show any improving effect on short-term memory impairment induced by ischemia/reperfusion. Itaconic acid at both the i.p. doses of 25 ($P<0.05$)

and 50 mg/kg (P<0.001) significantly improved short-term memory impairment after ischemia/reperfusion.

Conclusion : Ensi M. et.al, 2022, have found that itaconic acid can improve liver inflammation by inhibiting the NF-KB pathway and reducing the accumulation of transcription factor P-P65, and probably due to these anti-inflammatory properties of itaconic acid, this drug has been able to improve the damage caused by ischemia/reperfusion in the present study.

Keywords : Ischemia/reperfusion, Itaconic acid, Rat , Short term memory, Anxiety

Count: 379
Abstract ID: 264
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Comparison of interventions in in anterior vs. posterior circulation stroke: An Umbrella Review

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Background and Aim : While there are high-quality evidences comparing the efficacy of interventional treatments in Anterior Circulation Stroke (ACS) and Posterior Circulation Stroke (PCS), due to the various nature and outcomes of the studies it is necessary to reach a consensus on the outcomes. We conducted this Umbrella review to provide a comprehensive comparison of the efficacy and potential consequences of interventional techniques used in ACS and PCS.
Methods : : To find comparative systematic reviews reporting on patients treated with Mechanical Thrombectomy (MT) or Intra-Venous Thrombolysis (IVT) in ACS vs PCS, databases including PubMed, Scopus, and WOS were systematically searched. We assessed successful or full recanalization by thrombolysis in cerebral infarction (TICI) ≥ 2b, 90-day functional status, symptomatic intracranial hemorrhage (sICH), and 90-day mortality as our outcome of interest. For the risk of bias evaluation, the ROBIS tool was applied.
Results : A total of 5 studies were included. MT and IVT was evaluated in 3 and 2 studies, respectively. In terms of Successful recanalization, MT is equally beneficial in ACS and PCS. In terms of 90-day functional status, the PCS by MT has statistically lower outcomes. MT in PCS is associated to a lower risk of sICH and a higher rate of mortality during 90 days. IVT is associated with significant lower risk of sICH and better outcomes of 90-day functional status in PCS.
Conclusion : According to the reports, MT is the recommended and safer intervention in ACS patients because of better functional outcomes and lesser mortality and IVT is the recommended intervention in PCS patients.
Keywords : Anterior Circulation Stroke, Posterior Circulation Stroke, Umbrella Review

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Abstract ID: 180
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Endurance Training Preconditioning restores Antioxidant content and Integrity of the BBB in Hyppocampus of Psychosocial Stressed Male Rats Following Cerebral Ischemia-Reperfusion

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Background and Aim : Every year, millions of people in the world suffer from stroke at different ages. In general, stroke is the third cause of death in the world and a high cost is spent on the care of patients suffering from it. If the blood supply to a part of the brain is disturbed and stopped, this part of the brain can no longer function normally, and this condition is called a stroke. Psychosocial stress is a modifiable risk factor for stroke. Studies have shown that psychosocial stress induces the production of reactive oxygen species and causes oxidative stress, which increases the permeability of the "blood-brain barrier" and the formation of edema and cell death. It has been found that sports activity has important protective effects on the brain by reducing inflammation and oxidative stress, improving metabolism and increasing the stability of the blood-brain barrier. Research has also shown that exercise can reduce the size of the lesion caused by ischemia. This study aims to investigate the effect of psychosocial stress and exercise on oxidative stress and the expression of Occludin, MMP2, MMP9 and PV-1 genes and the level of P-selectin protein.

Methods : Fourty male rats were divided into 5 groups: control, sham, exercise, stress and stress + exercise. Animals were subjected to global stroke modeling surgery after performing training and psycho-social stress protocols. At the end of the study, the animals were anesthetized and blood samples was taken to study the oxidative indicators. In addition, the hippocampal tissue of the brain was removed to check the expression level of the Occludin, MMP2, MMP9 and PV-1.

Results : Endurance training increased the amount of antioxidant factors SOD and GPX and decreased the amount of oxidation factor MDA ($p<0.05$). It also reduced the expression of MMP-2, MMP-9 and PV-1 genes ($p<0.05$). However, endurance training raised the expression of Occludin gene. It also diminished the amount of P-selectin protein ($p<0.05$). Social stress reversed the beneficiary effects of exercise on these.

Conclusion : Based on the present study, regular exercise reduces the adverse effects of stroke induced damages, while exposure to psychosocial stress aggravates the condition for injured cases.

Keywords : Exercise, stroke, psychosocial stress, blood-brain barrier, antioxidant

Count: 381
Abstract ID: 239
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Astrocyte Involvement in Acute Ischemic Conditions: Insights from an In Vitro Model

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Background and Aim : Ischemic stroke results from reduced cerebral blood supply, causing oxygen and glucose deprivation, triggering a cascade of events leading to neuronal dysfunction and necrotic cell death. To investigate the pathophysiological mechanisms of ischemic brain injury, various in vivo and in vitro models have been developed to study the pathophysiological mechanisms of ischemic brain injury, with the oxygen-glucose deprivation (OGD) model being most relevant. Astrocytes, the predominant neuroglia in the central nervous system, are vital for neuronal support, maintenance, and metabolic functions through gliotransmitter release. Given their role in supporting neuronal repair, astrocytes are crucial during brain ischemia. In this study, we examined the impact of prolonged OGD on primary astrocyte cultures to create an in vitro ischemic stroke model during the acute phase.

Methods : Primary cortical astrocytes were isolated from neonatal rats and characterized using immunofluorescent staining against Glial fibrillary acidic protein (GFAP) and S100β. An in vitro model of acute ischemic stroke was established by subjecting these cells to 24h of OGD condition, simulating ischemic injury. Cell damage was assessed using the MTT assay, Annexin V-FITC/PI apoptosis flow cytometry, and real-time PCR.

Results : Astrocytes exposed to 24 h of OGD exhibited decreased cell viability and increased apoptosis. Gene expression analysis revealed the upregulation of hypoxia-inducible factor (HIF-

1?) and vascular endothelial growth factor (VEGF) during OGD. Pro-inflammatory cytokines (IL-6, TNF-?, IL-1?) were upregulated during OGD. Additionally, astrocytes showed increased expression of neurotrophic factors, including brain-derived neurotrophic factor (BDNF) and glial-derived neurotrophic factor (GDNF) during OGD.

Conclusion : This study introduces an in vitro model of acute ischemic stroke using primary astrocyte cultures exposed to prolonged OGD conditions. These findings underscore the remarkable resilience of astrocytes in severe ischemic conditions and highlight their dynamic roles in neuroprotection and inflammation resolution during the acute phase following ischemic insult. Overall, this research enhances our understanding of astrocytes' dual role in acute ischemia, providing valuable insights into potential therapeutic strategies for ischemic stroke .

Keywords : Glia; Ischemic stroke; in vitro model; Oxygen-glucose deprivation

Count: 382
Abstract ID: 182
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Pre-nutritional effects of hot (cinnamon) and cold (lentil) temperaments on the animal model of stroke

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Background and Aim : Stroke, mainly caused by atherosclerosis, is the second leading cause of death worldwide. Atherosclerosis may be caused by spleen dysfunction, and oxidative stress intensifies the brain damage induced by cerebral ischemia. According to the studies, cinnamon and lentils as hot and cold temperaments, respectively, contain antioxidant compounds and affect spleen function. This study investigated and compared the effect of cinnamon and lentils in preventing stroke.

Methods : Cinnamon and lentil extracts were injected intraperitoneally daily to adult male Wistar rats for 30 days, and at the end, a rotarod test was carried out. Then, blood samples were taken from their eyes. The rats were submitted to the ischemic stroke, and the activity level of Catalase (CAT), Superoxide Dismutase (SOD), and total antioxidant were measured. The ischemic stroke model was implemented using the MCAO method. Infarct area and ischemic tolerance were measured by the MCAO (Middle Cerebral Artery Occlusion) method, and infarct volume was assessed by 2,3,5-triphenyl tetrazolium chloride.

Results : Chronic use of lentil extract decreased motor function, CAT, SOD, and total antioxidant activity compared with cinnamon extract. The cinnamon extract improved the ischemic tolerance and reduced the infarct size. The group receiving lentil extract could not tolerate ischemia and died during the experiment.

Conclusion : It seems that diet adjustment can effectively reduce the incidence of stroke or its complications. Awareness of food temperament and its relationship with various diseases can reduce disease burden, though further studies should be conducted on this topic.

Keywords : Ischemic stroke; cinnamon; lentil

Count: 383
Abstract ID: 286
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Age cut-off for evaluating multiple sclerosis patients' cognitive impairment

Submission Author: SEYEDEMAD SEYEDGHOLAMYSHARABIANI

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Background and Aim : Cognitive impairments (CI) are more likely in ms patients but it has a time and cost consuming process so it is necessary to search for screening factors for the assessment of high-risk patients like age of patients, that associated with multiple sclerosis MS-related CI. This study aims to find the best age cut-off for evaluation of MS-related CI.

Methods : this is a cross-sectional study that used Cambridge Neuropsychological Test Automated Battery (CANTAB) for CI evaluation and conducted statical analysis using the SPSS and the Youden's index was utilized to find the best cut-off value.

Results : 124 MS patients involving 49 CI patients and 75 NCI patients have participated. There was no significant difference between the groups regarding the sex (p=0.16), employment status (p=0.65), disease duration (p=0.08), and depressive status (p=0.28). Age (37 [24 – 44] vs. 28 [24 – 34.5]; p-value<0.01) and expanded disability status scale (EDSS) (2.5 [1 – 4.0] vs. 0 [0 – 1.75]; p-value: 0.01) was fond be significantly different between groups of the study. In logistic regression, age was an independent factor associated with MS-related CI (p=0.02). Age>38 years was the best cu-off value for predicting MS-related CI (Sensitivity: 40.8%; specificity: 90.7%).Also we figured The ROC curve for predictive value of age for MS-related CI .

Conclusion : as we know age is proper screening factor for MS-related CI.in this study Determined that MS patients with age>38, should be evaluated for CI. Ethical Code: IR.TBZMED.REC.1400.899).

Keywords : cognitive dysfunction, multiple sclerosis,age cut-off

Count: 384
Abstract ID: 278
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Exploring the Potential of Exosomal miRNAs as Biomarkers for Multiple Sclerosis: A Comprehensive Analysis of CSF and Serum Samples

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Background and Aim : Multiple Sclerosis (MS) is a chronic inflammatory demyelinating disease affecting the central nervous system (CNS). Despite extensive research, a definitive diagnostic test for MS remains elusive. However, emerging evidence suggests that circulating exosomes hold promise as potential biomarkers for a wide range of human diseases. These extracellular vesicles contain RNA, DNA, and proteins, possess the ability to traverse the blood-brain barrier, and are secreted by various cell types, including those within the CNS. In light of this, our study aims to investigate the utility of cerebrospinal fluid (CSF) and serum exosomal miRNAs as a non-invasive biomarker for the detection and monitoring of relapsing-remitting multiple sclerosis (RRMS).

Methods : In this study, we collected CSF and serum samples, one ml, from each of the 30 untreated patients diagnosed with RRMS and healthy controls (HCs). Our investigation focused on a panel of specific miRNAs, miR-18a-5p, miR-26b-5p, miR-132-5p, and miR-150-5p, which have been associated with regulating inflammatory responses. Following the isolation of exosomes from CSF and serum samples, we utilized qRT-PCR to perform a comprehensive analysis. The objective was to identify any significant variations in the expression levels of exosomal miRNAs within the CSF and serum samples obtained from RRMS patients.

Results : We identified that 3 out of 4 miRNAs displayed different patterns in RRMS patients compared to HCs. miR-18a-5p with dual pro-inflammatory and anti-inflammatory actions and miR-150-5p with anti-inflammatory action were significantly upregulated in both CSF and serum-

derived exosomes of RRMS patients compared to corresponding HCs. Additionally, anti-inflammatory miR-132-5p was significantly downregulated in both CSF and serum-derived exosomes of RRMS patients compared to HCs. However, there was no significant difference in the expression level of miR-26b-5p in CSF and serum exosomes between patients and control groups.

Conclusion : Our findings demonstrate that exosomal miR-18a-5p and miR-150-5p hold promise as potential biomarkers in RRMS. Moreover, the utilization of exosomal biomarkers has the potential to significantly advance the early detection of progressive disease onset, surpassing current clinical approaches and the manifestation of clinical symptoms. To implement this application effectively, longitudinal research is necessary, and further investigations should be conducted based on the preliminary findings to establish longitudinal studies.

Keywords : Relapsing Remitting MS (RRMS); MicroRNA (miRNA); Exosome; Serum; Cerebrospinal Fluid (CSF)

Count: 385
Abstract ID: 280
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Exploring Lipids as Potential Markers for Cognitive Impairment in Multiple Sclerosis

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Background and Aim : - Multiple sclerosis (MS) is an immune-related central nervous system disorder characterized by a wide range of symptoms, including motor dysfunction, sensory disturbances, and cognitive impairment. Several biomarkers, such as cerebrospinal fluid neurofilament light chains and serum vitamin D, have shown promise in understanding MS-related cognitive impairment. Lipids play a crucial role in CNS function and tissue health, and recent studies suggest a link between lipid levels and conditions like Alzheimer's disease. The lipid profile, which includes total cholesterol (TC), high-density lipoprotein cholesterol (HDL), triglycerides (TG), and low-density lipoprotein cholesterol (LDL), may also be associated with MS progression and disability. This systematic review explores the relationship between serum lipid profiles and cognitive outcomes in MS patients.

Methods : - This systematic review encompassed studies focusing on cognitive function. The review excluded animal studies, conference abstracts, non-English studies, and retracted works. Extensive searches were conducted across various medical databases. The evaluation encompassed study details like author, publication year, sample size, participant characteristics, MS type,

disability status, disease duration, cognitive assessment methods, serum lipid levels, and study results. The Joanna Briggs Institute's critical appraisal tool was employed for assessing the risk of bias, guided by an eight-question checklist for cross-sectional studies. The meta-analysis used CMA3 software and focused on studies reporting the correlation "r" between serum lipids and cognitive scores. Results were presented with 95% confidence intervals and a significance level of $p < 0.05$.

Results : - In this systematic review, 508 studies were initially screened in the title/abstract stage, ultimately leading to the inclusion of seven studies. The phenotype of MS varied, with some studies focusing on Relapsing-Remitting MS (RRMS) and others encompassing a combination of RRMS, primary progressive MS (PPMS), and secondary progressive MS (SPMS). Cognitive assessment tools varied and included the Minimal Assessment of Cognitive Function in MS (MACFIMS), Brief International Cognitive Assessment for MS (BICAMS), Montreal Cognitive Assessment (MoCA), Brief Repeatable Battery of Neuropsychological Tests (BRB-N), and more. The risk of bias assessment highlighted common issues related to confounders. The review found varying results in different studies regarding the correlation between serum lipid profiles and cognitive outcomes in MS patients. Some studies suggested potential links between cholesterol pathway biomarkers and cognitive impairment, while others reported negative correlations between lipid markers and cognitive scores. In the quantitative synthesis, a significant correlation was found between TC levels and MoCA scores, but other cognitive test scores did not show statistically significant correlations with lipid levels.

Conclusion : Serum TC levels are inversely linked to the cognitive function of MS patients. LDL and TC show stronger associations with cognitive outcomes in MS compared to HDL and TG. Serum lipids cannot be considered a definitive marker for MS-related cognitive impairment, but they may be a suggestive marker and potential target for therapeutic interventions. Caution should be exercised when making clinical recommendations based on these findings.

Keywords : Lipid; Lipoproteins; Cholesterol; Multiple Sclerosis; Cognition Disorders; Meta-analysis

Count: 386
Abstract ID: 336
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The co-administration of Boswellia Serrata extract and mesenchymal stem cell transplantation improves behavioral, histopathological and oxidative stress changes of the brain in Multiple Sclerosis

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Background and Aim : The treatment of MS (Multiple Sclerosis) has been a major challenge for researchers for many years. In recent decades, the use of MSCs and natural substances has been considered as an effective treatment in the treatment of various diseases including neurodegenerative diseases. In this study, we investigated the effect of simultaneous use of Boswellia Serrata aqueous extract and adipose tissue mesenchymal stem cell transplantation in an animal model of coprizon-induced Multiple Sclerosis.

Methods : 42 C57BL6 mice were randomly divided into six groups, including: control (Co), MS, MS+DMEM (culture medium), MS+SC (stem cells), MS+Bos (Boswellia extract), and MS+SC+Bos. Animals in groups 2 to 6 were demyelinated by oral administration of 0.3% doses of Coprizon for 6 weeks. Stem cells were injected intraperitoneal with a dose of 1 million cells and aqueous extract of Boswellia at a dose of 100 mg/kg. Behavioral, histopathological, immunohistochemical and oxidative stress assessments were performed at the end of the experiment.

Results : Boswellia aqueous extract and stem cells in an animal model of MS induced by Coprizon, were able to increase animal resistance in rotarod test, prevent weight loss, reduce demyelination

rate and increase remyelination in the corpus callosum. They also increase the number of oligodendrocytes, astrocytes, MBP protein expression and TAC levels and decrease MDA levels. These changes were more pronounced in the group that received both the aqueous extract of the Boswellia and the stem cells at the same time.

Conclusion : This study showed that co-administration of Boswellia aqueous extract and adipose tissue mesenchymal stem cells due to their antioxidant properties, immune modulation, anti-inflammatory and neuroprotevtive, could possibly be a new and effective therapeutic approach in functional and structural protection of the nervous system in MS disease.

Keywords : Boswellia Serrata extract, Mesenchymal stem cell, MS disease, Demyelination, Mice

Count: 387
Abstract ID: 269
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Investigating the link between inflammatory biomarkers and neurotrophic factors and cognitive impairment in MS

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Background and Aim : Multiple sclerosis is a chronic disease characterized by inflammatory damage to the myelin sheath in central nerves system. Cognitive impairment (CI) is an often neglected, yet common, debilitating feature of MS. This study aims to assess the correlation between the circulating markers of inflammation and neurotrophic factors and MS-related CI.

Methods : In this cross-sectional study, CI was evaluated using the Cambridge Neuropsychological Test Automated Battery (CANTAB), and the serum levels of biomarkers, including interferon-γ (INF-γ), C- reactive protein (CRP), ciliary neurotrophic factor (CNTF), and glial cell line–derived neurotrophic factor (GDNF), were measured based on Enzyme-linked immunosorbent assay (ELISA).

Results : A total of 65 patients participates in this study, 21 of which were diagnosed with CI and formed the case group, and 44 formed the NCI group. There was no remarkable difference in demographics, disease duration, and expanded disability status scale (EDSS) between the two groups. The tests indicated a significant difference in IFN-γ, CRP, and GDNF levels between the groups (ROC curve is drawn). IFN-γ and CRP serum levels had an association with subtests of RTI (Reaction Time) and PAL (Paired Associates Learning) tasks. GDNF levels in the serum correlated with subtests of SWM and RVP tasks. However, there was no association detected between serum levels of CTNF with any of the CANTAB tasks. IFN-γ (p=0.041), and GDNF (p=

0.037) factors revealed a significant difference between groups, after adjusting for age, sex, disease duration, and EDSS.

Conclusion : The serum level of inflammation markers (IFN-γ) and neurotrophic factors (GDNF) are in correlation with cognitive impairments and can be used for CI diagnosis in MS patients. Acknowledgments: Ethical Code: IR.TBZMED.REC.1398.624

Keywords : cognitive dysfunction; multiple sclerosis; inflammatory biomarkers

Count: 388
Abstract ID: 271
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Stem-cell therapy for multiple sclerosis-related bladder dysfunctions; a systematic review

Submission Author: Niloufar Pourakbar

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Background and Aim : Lower urinary tract symptoms (LUTS) are the prevalent but neglected symptoms in multiple sclerosis (MS) patients. This systematic review study assesses both the pre-clinical and clinical studies that evaluate the applications of stem-cell-based therapies (SCT) in MS-related LUTS.

Methods : This study was performed following the PRISMA statement. A systematic search was performed through PubMed and Google Scholar with ((Multiple sclerosis) OR (experimental autoimmune encephalomyelitis)) AND ((Urinary Bladder, Overactive) OR Urodynamics OR (neurogenic bladder) OR (lower urinary tract dysfunction) OR LUTS) AND ((stem cells) OR (cells, cultured) OR (stem cell transplantation) OR (hematopoietic or mesenchymal)) keywords in November 2021 and relevant studies were retrieved.

Results : Out of 219 results from electronic and hand searches, finally, four records, including one experimental study on mice with experimental autoimmune encephalomyelitis (EAE), two clinical studies, and one clinical trial registry, met our inclusion criteria. Zhibo Jin et. al. intraperitoneally injected the stem-cell factor cytokine and as a result, this treatment could ameliorate the urine retention, micturition frequency and urine output per micturition. Riordan et al. in a 1-year study, assessed the safety and feasibility of umbilical cord mesenchymal stem cells (20?×?106 over 7

days) and reported an improvement in bladder function, assessed by Scripps Neurological Rating Scale, after 1 month, but this improvement was not significant after 1-year of intervention. Harris et al. intrathecally administered bone marrow mesenchymal stem cell-derived neural progenitor in three separate doses of up to 1?×?107 cells per dose and all subjects underwent urodynamic testing at baseline and three months after the third dose. Of the 18 study subjects, nine subjects (50%) demonstrated either symptomatic and/or urodynamic improvement in bladder function. Finally, a phase II, double-blinded, placebo-controlled, randomized, cross-over study was registered in ClinicalTrials.gov (Identifier: NCT03355365) with an estimated primary completion date of May 2022, tend to assess the degree of bladder dysfunction by urodynamics testing at baseline, Months 13 and 27 after intervention in each group. In this study, Autologous Mesenchymal Stem Cell-derived Neural Progenitors were compared to placebo in patients with progressive MS.

Conclusion : The evidence regarding the efficacy and safety of STC in MS-related LUTS is limited and there is a need for future pre-clinical as well as clinical studies in this topic.

Keywords : Stem-cell therapy; multiple sclerosis

Count: 389
Abstract ID: 443
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Senescence occurs in white matter is in association with myelin disruption during normal aging in mice

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Background and Aim : Myelin as a major portion of white matter (WM) enhances the impulse conduction velocity and the transmission efficiency. WM integrity relies on a proper myelination process during a lifetime. Aging compromises regenerative processes including remyelination and forming of the new myelin sheaths. It is important to distinguish changes provoke by normal aging. We hypothesized that myelin decline over the time and its coincidence with cell cycle arrest in WM.

Methods : In the present study, we characterized myelin changes during aging. We used C57bl-6 mice in three different ages, young (2 months old), mature adults (5 months old), and aged mice (16 months old). We investigated the total myelination level, and molecular and structural changes in a corpus callosum

Results : Our results demonstrated a variety of age-related ultrastructural WM changes, including disrupted WM integrity, increased disassociation of the myelin sheaths from the axons, and myelin balloon formation, which have been observed in corpus callosum during normal brain aging. Our results also provided evidence that cellular senescence occurred in corpus callosum chronologically. There was evidence of upregulation of cell cycle arrest genes p16, p21, and p53 in aged mice. We also exhibited, increased senescence-associated β-galactosidase (SA-βgal) activity, a marker of cellular senescence in aged mice compared to the younger mice.

Conclusion : This study aimed to elucidate the WM alterations during normal aging. Our data suggested that the myelin degeneration occurs in corpus callosum throughout the life. Aged mice exhibited disrupted myelination and different WM ultrastructure due to senescence occurrence. These finding may imply for the role of demyelination in decline in regular brain activity during aging.

Keywords : White matter; Myelination; Aging; Senescence

Count: 390
Abstract ID: 560
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Oligodendrocyte lineage cell gene expression following three weeks of cuprizone withdrawal in the chronic demyelination C57BL/6 mouse mode

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Background and Aim : Multiple sclerosis (MS) is a chronic, inflammatory, autoimmune, neurodegenerative, and heterogeneous disease characterized by a wide range of symptoms. Pathological damage to the central nervous system (CNS), from the brain to the spinal cord, is common in different stages of MS, and the spinal cord is heavily affected in MS patients, also its involvement contributes substantially to disease progression. MS spinal cord lesions are usually focal, involve one or two segments, and appear most commonly in the cervical area. Since the spinal cord is the main path of ascending and descending pathways, lesions in this region can cause wide and different sensory and motor consequences, such as movement disorders. Cuprizone is a well-characterized animal model for MS that causes cell death of oligodendrocytes, which leads to demyelination. This model offers potential for a better understanding of demyelination genetic mechanisms. In the present study, we evaluate the gene expression of the oligodendrocyte lineage cell gene following three weeks of cuprizone withdrawal in the chronic demyelination C57BL/6 mouse model.

Methods : Six-week-old male C57BL/6 mice were procured from the Pasteur Institute of Iran (Tehran, Iran). The mice were randomly divided into two groups. The control group received a normal diet throughout the 15-week study period. Conversely, the demyelination group was fed

chow containing 0.2% cuprizone for 12 weeks, followed by a switch to a normal diet for 21 days. After the study, the animals were euthanized, and their spinal cords were isolated for gene expression assessment via qRT-PCR. In statistical analysis, a significance level was set at $p<0.05$.

Results : Results obtained after the 15-week study period indicated that relative gene expression of myelin basic protein (Mbp), a gene specific to mature oligodendrocytes, did not exhibit significant differences compared to the control group. In contrast, oligodendrocyte transcription factor 2 (Olig2), expressed in pre-oligodendrocytes, showed statistically significant differences ($p < 0.01$) compared to the control group.

Conclusion : In conclusion, our findings suggest that chronic demyelination induced by cuprizone intoxication in C57BL/6 mice may activate oligodendrocyte precursor cells (OPC), a relatively minor neurogenic niche of stem cells situated around the spinal cord central canal in adult mammals. This activation potentially leads to increased OPC lineage proliferation as a supportive source in remyelination. These insights shed light on the dynamic response of OPCs in chronic demyelination and contribute to our understanding of their role in facilitating effective remyelination strategies.

Keywords : Multiple Sclerosis; Spinal cord; Cuprizone; Demyelination; Oligodendrocyte lineage cells; Neurogenic niche

Count: 391
Abstract ID: 338
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Histopathological and molecular evaluation of the subventricular zone following three weeks of cuprizone withdrawal in chronic demyelination C57BL/6 mouse model

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Background and Aim : Multiple sclerosis (MS) is the most common chronic demyelinating disease affecting various parts of the central nervous system (CNS). The subventricular zone (SVZ), a major neural stem cell niche that generates neurons and glia throughout life, was gradually emptied during MS progression. Oligodendrocyte progenitor cells (OPCs) originating from the SVZ eventually differentiate into mature oligodendrocytes and form the tightly wrapped myelin sheath around neurites. Following demyelination insults like what occurs in MS, SVZ is induced to generate more OPCs to migrate to the demyelinated area and enhance remyelination. Cuprizone-fed C57BL/6 mouse, a well-known animal model of MS, is a neurotoxic copper chelator that fundamentally targets the oligodendrocytes and induces demyelination, consequently leading to dysfunction in neural conductions. This study aims to determine the effect of chronic cuprizone exposure on histopathological and molecular events in the subventricular zone of C57BL/6 mice.

Methods : Male adults C57BL/6 obtained from the Pasteur Institute of Iran (Tehran, Iran) were randomly divided into two groups. The control group (CONT) received a normal diet for 15 weeks,

and the cuprizone group (CPZ) received chow containing 0.2% cuprizone for 12 weeks and continued a normal diet for three weeks after that. After the end of the 15th week, the animals were sacrificed, and the SVZ was evaluated for oligodendrocyte lineage cell gene expression, including SRY-Box Transcription Factor 10 (Sox10) and platelet-derived growth factor receptors (Pdgfr) via qRT-PCR. In addition, histopathological examinations were carried out using Luxol fast blue/periodic acid-Schiff (LFB/PAS) staining for changes in the subventricular zone.

Results : The qRT-PCR analysis indicates that the relative expression of Sox10 and Pdgfr genes in the cuprizone group was significantly increased in the SVZ compared to the control group (p?0.001) at the end of the 15th week of the study. Qualitative histopathological evaluations revealed the significant presence of a cell population in the SVZ following three weeks of cuprizone withdrawal.

Conclusion : After three weeks of cuprizone withdrawal, oligodendrocyte progenitor genes have significantly increased in SVZ, which may be attributed to the generation of new oligodendrocyte progenitor cells as a possible cell population for replenishing the pools.

Keywords : Multiple Sclerosis; Subventricular zone; Oligodendrocyte progenitor cells; Cuprizone; Demyelination

Count: 392
Abstract ID: 582
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Coenzyme Q10 Supplementation in Multiple Sclerosis: A Systematic Review

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Background and Aim : -Multiple sclerosis (MS) is an inflammatory neurodegenerative disease characterized by immune-mediated damage to myelin and axons in the central nervous system. Oxidative stress also contributes to tissue injury in MS. As an antioxidant and electron carrier in mitochondria, coenzyme Q10 (CoQ10) may have therapeutic potential in MS. This systematic review synthesized evidence on the efficacy and safety of CoQ10 supplementation in MS patients.

Methods : -A comprehensive literature search was conducted in PubMed, Scopus, Embase and Web of Science in May 2023. Randomized controlled trials (RCTs) and retrospective analyses of CoQ10 supplementation in MS patients were included. Risk of bias was assessed using the Revised Cochrane risk-of-bias tool for randomized trials (RoB2). Outcomes evaluated were effects on oxidative stress, inflammation, fatigue, depression, disability progression, cognition, neural growth factors, and adverse events.

Results : -The preliminary literature search identified 237 potentially relevant articles. After screening, 8 studies met the inclusion criteria - 7 randomized controlled trials (RCTs) and 1 retrospective analysis. The results showed that taking 200mg/day of coQ10 supplement for 2-3 months did not significantly affect levels of neuronal growth factors in the blood. However, there were inconsistent findings on whether this dose impacted inflammatory markers, antioxidant

enzymes, and lipid peroxidation. In contrast, taking 500mg/day of coQ10 supplement for the same duration appeared to reduce oxidative stress and inflammation. This higher dose also seemed to lessen symptoms of depression and fatigue in multiple sclerosis patients. These findings imply that coQ10 may have dose-dependent effects, with higher doses of 500mg/day potentially improving outcomes related to inflammation, oxidative stress, depression and fatigue.

Conclusion : CoQ10 supplementation displays antioxidant and potential anti-inflammatory effects in MS patients. Preliminary evidence indicates possible benefits for fatigue and depression. However, current research does not demonstrate an impact on disability outcomes. Effects may depend on adequate dosing and treatment duration. Larger RCTs with clinical endpoints are needed to establish efficacy. Safety appears favorable but systematic adverse event monitoring is lacking. Overall, CoQ10 is a promising supplement for MS warranting further study. Determining optimal dosage and treatment length should be a priority.

Keywords : Multiple Sclerosis; Coenzyme Q10; systematic review

Count: 393
Abstract ID: 667
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Prevalence of Sexual Dysfunction and Its Contributor Among Iranian Women with Multiple Sclerosis

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Background and Aim : Multiple Sclerosis (MS) is a kind of auto-immune disease in which nerve fibers are attacked by the immune system and were demyelinated. Female Sexual dysfunction (FSD) is one the of main complaints in women with MS and it affects different aspects of their lives. We aimed to determine the prevalence of sexual dysfunction among MS patients and address the main contributing factors. This information will help us to determine more at-risk groups and design more effective therapeutic and preventive strategies.

Methods : This cross-sectional study was performed with non-random convenience sampling on 100 women with MS who were referred to Bu-Ali Sina Hospital in 2020-2021. We excluded patients with previously impaired sexual function due to another disease, a history of surgery, and radiotherapy on the hip, and patients who did not complete informed consent. We completed the Female Sexual Function Index (FSFI) questionnaire for each participant. Patients were categorized based on their disability index Expanded Disability Status Scale (EDSS) by a neurology specialist. Data were analyzed using SPSS 25 software. A significance level of less than 0/05 was considered.

Results : The mean age of study participants was 37.4±7.8 years. We observed a negative significant correlation between EDSS and FSFI score (r=-0.371, P-value=0.001). The correlation between FSFI score and age (r= -0.371, P-value= 0.001), parity (r= -0.322, P-value= 0.001), and disease duration (r= -0.371, P-value<0.001) was also statistically significant. The mean of FSFI in

the patients with university graduation was 25.0±5.3, while it was 22.2±6.4 and 20.1±8.0 in diploma and less than diploma groups, respectively (P-value<0.05).

Conclusion : We found that 80% of our study participants were diagnosed with female sexual dysfunction which was in accordance with a previous study by Dehghan et al. We spotted a high prevalence of sexual dysfunction among women who were suffering from MS. The younger age, lower parity, high duration of disease, and more disabled patients (high EDSS) were addressed as more at-risk groups of impaired sexual function and must be considered for both preventive and therapeutic strategies.

Keywords : Sexual dysfunction; multiple sclerosis; quality of life

Count: 394
Abstract ID: 69
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Impact of royal jelly consumption on oxidative stress, EDSS and quality of life of patients with Multiple Sclerosis, a randomized, double-blind placebo controlled study

Submission Author: Susan Sabbagh

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Background and Aim : , over 2.3 million people are suffered from multiple sclerosis (MS), a multifactorial demyelinating disease of the central nervous system. The most common symptoms of MS patients are chronic pain, fatigue, motor and mobility disorders. The participation of redox processes in the pathogenesis of MS has been recently highlighted. The aim was to access the consumption possible protective effect of royal jelly consumption on EDSS, oxidative stress parameters, fatigue and quality of life of RRMS patients.

Methods : : sixty one RRMS patients randomly divided to two placebo and RJ groups. Both groups receive capsules for 45 days. Blood sampling was done pre and post treatment time. Amount of NO, MDA and activity of CAT and SOD were measured in addition to acquisition of MSQoL-54 and MFIS questionnaire and determination of EDSS at the beginning and end of study.

Results : obtained results showed significant lowered score of EDSS in RJ group ($P < 0.001$). In addition the level of MDA in this group, was became significantly lowered ($P < 0.0001$). The activity of SOD and CAT after consumption of RJ had increased significantly ($P < 0.0001$), ($P < 0.001$) respectively. Some parameters of questionnaires of fatigue and quality of life changed significantly

Conclusion : current study showed RJ could improve motor function and EDSS score of patients. In addition in this group serum level of lipid peroxidation was decreased and the content of serum anti-oxidant was increased. Some parameters of fatigue and quality of life were improved. It seems that consumption of RJ in MS patients could slow down the progression of the disease

Keywords : Multiple sclerosis, Royal jelly, Oxidative Stress, EDSS, Fatigue, Quality of life.

Count: 395
Abstract ID: 60
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Effect of Intermittent Fasting Diet on the Hippocampus of Adult Male Mouse After Inducing Demyelination by Ethidium Bromide Injection

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Background and Aim : Intermittent fasting diet (IF) as a restrictive regimen prevents neural degeneration and stimulates overexpression of various neurotropic factors in the hippocampus of animal models. This study evaluates the potential effect of the IF in the prevention of learning and memory dysfunction and improving the alterations in the number and volume of neurons in an ethidium bromide (EB) induced mouse model of demyelination.

Methods : Mice were randomly assigned into N group (Normal Diet and normal saline injection), F group (IF and normal saline injection), EBN group (Normal Diet and EB injection), EBF group (IF and EB injection). The hidden platform test was carried out based on path length, escape latency and swim speeds of mice. Stereological studies were determined by the Cavalieri and the Optical Dissector technique.

Results : Maintenance of mice on the IF results in significantly decreased the body weight and biochemical parameters, increased total number of neurons and volume of the hippocampus, and improved learning and memory parameters of adult male mice. However, IF in EBF group did not show as excellently as F group. The EBF group displayed significantly spatial memory improvement than that in EBN group. There were no statistically significant differences between EBF and EBN groups in stereological and learning parameters, though the EBF group displayed faster escape latencies, and swam faster and shorter path lengths than the EBN group in these parameters.

Conclusion : The IF fairly improved some adverse effects of EB in experimental demyelination models

Keywords : Intermittent fasting diet; Hippocampus; Demyelination; Stereology; Mice

Count: 396
Abstract ID: 618
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Effect of Mesenchymal Stem Cells Transplantation On Remyelination in a the Cuprizone Model of Multiple Sclerosis Disease

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Background and Aim : Multiple Sclerosis (MS) is a chronic inflammatory demyelination disorder in the central nervous system (CNS), which often affects young adults. Some studies reveal the effects of stem cell transplantation on increased myelination in MS animal models. In the present study the effect of mesenchymal stem cell transplantation (MSCs) was investigated in a chronic cuprizone-induced demyelination model, in which its positive or negative effects on remyelination are identified in the experimental model of MS.

Methods : In this study, 30 male 8-week-old C57BL/6 mice weighing 25-25 g, were used and divided into 3 groups. The study groups included: control, cuprizone, cell transplantation (cuprizone + cell). In this study, the mice were exposed to 0.2% cuprizone diet for 12 weeks. Then MSCs were injected into the corpus callosum brain of the mice at the beginning of week 13. Two weeks after cell transplantation, the mice were examined by Rotarod test. Also, the myelin sheath in corpus callosum was evaluated by Luxol-fast blue staining and transmission electron microscopy (TEM). Glial cells also were assessed by immunofluorescence staining and the factors secreted through MSCs was evaluated by quantitative real-time PCR. Finally, data was analyzed by SPSS software and ANOVA test.

Results : The results of Roatard test showed that there was a significant increase in balance and motor coordination in group of cell transplantation compared to the cuprizone group ($p < 0.05$). Also, the results of histological examination and electron microscopy showed that MSCs

transplantation caused remyelination in cell transplantation group compared to the cuprizone group ($p < 0.05$). Based on the results of glial cell analysis with immunofluorescence technique, the number of oligodendrocyte cells in the corpus callosum region was significantly increased in cell transplantation group compared to the cuprizone group ($p < 0.05$). The mRNA expression level of trophic factors of NGF and BDNF secreted by MSCs was significantly increased in cell transplantation group than cuprizone group ($p < 0.05$).

Conclusion : The results of this study showed that mesenchymal stem cell transplantation could increase the remyelination of corpus callosome axons in the cuprizone model of multiple sclerosis.

Keywords : Multiple Sclerosis (MS), Cuprizone (CPZ), Remyelination, Mesenchymal Stem Cells (MSCs)

Count: 397
Abstract ID: 669
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Association between the Multiple Sclerosis Epidemic and Socioeconomic Status in Iran: A Descriptive-Analytical Cross-Sectional Study

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Background and Aim : Multiple sclerosis (MS) is a key neurogenic cause of disability among young populations. Assessing the parameters affecting MS severity is vital to reduce the disease burden. This study aimed to determine the relationship between socioeconomic status (SES) and MS severity among young Iranian adults.

Methods : A descriptive-analytical cross-sectional study was conducted on 180 patients (142 females and 38 males) with MS selected by non-probability and consecutive sampling during September 2018-2019. The socio-demographic and primary clinical data were collected by a self-developed questionnaire and face-to-face interviews, respectively. The Expanded Disability Status Scale (EDSS) was used to assess the physical disability and overall neurological function of patients.

Results : The mean age of patients and MS onset were 27.54 and 35.58 years, respectively. The majority of patients were married (68.3%) and lived in cities (74.4%). The mean values of unemployment, homeownership, and monthly income were 54.4%, 71.7%, and 11,078,330 IRR,

respectively. The mean EDSS was 2.80±1.79 points. A weak positive correlation was found between EDSS and patients' age (P = 0.001, r = 0.246) and number of children (P = 0.001, r = 0.250). There was no significant difference between EDSS and SES factors (i.e., disease onset age, treatment cost, and monthly income).

Conclusion : As SES was not related to MS severity, there is no need to take special treatment measures in patients with poor SES.

Keywords : Multiple sclerosis, Expanded disability status scale, Epidemiology, Disease progression, Diagnosis

Count: 398
Abstract ID: 204
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Administration of growth hormone ameliorates adverse effects of total sleep deprivation

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Background and Aim : Total sleep deprivation (TSD) causes several harmful changes including anxiety, inflammation, and increased expression of extracellular signal-regulated kinase (ERK) and tropomyosin receptor kinase B (TrkB) genes in the hippocampus. The current study was conducted to explain the possible effects of exogenous GH against the above parameters caused by TSD and the possible mechanisms involved.

Methods : Male Wistar rats were divided into 1) control, 2) TSD and 3) TSD + GH groups. To induce TSD, the rats received a mild repetitive electric shock (2 mA, 3 s) to their paws every 10 min for 21 days. Rats in the third group received GH (1 ml/kg, sc) for 21 days as treatment for TSD. The motor coordination, locomotion, the level of IL-6, and expression of ERK and TrkB genes in hippocampal tissue were measured after TSD.

Results : The motor coordination ($p < 0.001$) and locomotion indices ($p< 0.001$) were impaired significantly by TSD. The concentrations of serum corticotropin-releasing hormone (CRH) ($p < 0.001$) and hippocampal interleukin-6 (IL-6) ($p < 0.001$) increased. However, there was a significant decrease in the interleukin-4 (IL-4) concentration and expression of ERK ($p < 0.001$) and TrkB ($p < 0.001$) genes in the hippocampus of rats with TSD. Treatment of TSD rats with GH improved motor balance ($p < 0.001$) and locomotion ($p < 0.001$), decreased serum CRH ($p < 0.001$), IL-6 ($p < 0.01$) but increased the IL-4 and expression of ERK ($p < 0.001$) and TrkB ($p < 0.001$) genes in the hippocampus.

Conclusion : Results show that GH plays a key role in modulating the stress hormone, inflammation, and the expression of ERK and TrkB genes in the hippocampus following stress during TSD.

Keywords : Total sleep deprivation · Growth hormone · Locomotion · CRH · Inflammation · ERK and TrkB expression

Count: 399
Abstract ID: 458
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Investigation of the prevalence of brachial plexus birth paralysis in Alzahra hospital from 2018_2023

Submission Author: Sahel Rezaee

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Background and Aim : Brachial plexus birth paralysis is a neurological condition that affects the movement and sensation of an infant's arm due to damage the brachial plexus nerves during birth.The incidence of brachial plexus birth paralysis (BPBP) is changing over time in our country and the current data is unknown at the moment.Besides, there isn't updated and sufficient data in some parts. Also, a reason that makes the necessity of this study more prominent is how it's impacting the quality of life for affected infants and their families. Moreover, another purpose is to reveal that BPBP isn't only because of vaginal delivery, but also it can happen in some cesarean sections, too. This can change people's attitude like in other countries in the world.

Methods : This study will employ a retrospective cohort design. Data will be collected from the medical records of all infants delivered at AlZahra hospital between 2018_2023. The sample size will be determined based on estimation of the prevalence of brachial plexus birth paralysis. Descriptive statistics will be used to calculate the prevalence rates and determine the demographic factors associated with the condition. In-depth interviews with parents of affected infants will be conducted to explore.

Results : The database yielded a combined total of 16,437 population births at Al-Zahra Hospital in Rasht from April 2018 to October 2023. Incidence of BPBP is 0.19% (19 cases per 10,000 births) suffered from brachial nerve plexus paralysis. The majority (64.5%) were boys and 96.8% were born through natural delivery. The average age of mothers was 30.6 ± 7.3 years. Only 2.3%

of the mothers of these babies had hypertension and 45.2% had diabetes. The average age of the fetus at delivery was 38.8 ± 1.2 weeks, with the average height, weight and head circumference being 51.3 ± 2.6, 3620.7 ± 405.2, and 34.6 ± 1.3. Also, these babies had a mean Apgar score of 1 and 5 minutes equal to (9-8) 9 and (9-10) 10. In all these samples, the amniotic fluid was normal. The right shoulder was involved in 61.3% of the samples, the majority (90.3%) had scapular dislocation and 74.2% had clavicle fracture .

Conclusion : According to this study, contrary to people's perception that BPBP occurs only in vaginal delivery, it was observed in this study that the belief should be changed that such a complication is also possible in cesarean section, too. Moreover, This study demonstrates that there is a great need to a nationwide education on how to have a safe mode of delivery with less dystocia and that concludes a great importance because of its effect on these babies future.

Keywords : incidence, brachial plexus birth paralysis, Labor complication, Obstetric

Count: 400
Abstract ID: 616
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Using microRNAs as biomarkers in ASD: A Review study

Submission Author: Mohammad Kordkatouli

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Background and Aim : Autism spectrum disorder (ASD) is a type of neurological disorder that affects a person's development and is associated with a complex clinical presentation that usually manifests between the ages of 18 and 36 months. This disease causes people to have interaction deficits. having very limited social interests and stereotyped behaviors, which is a diagnostic announcement for this disease. There are many studies showing that miRs play a role as biomarkers in this disorder and affect the expression of genes related to different neural pathways that are involved in ASD.
Methods : -In this review article, 45 scientific research and review articles from SID, Pubmed, Scopus, and Google Scholar databases have been collected and analyzed.
Results : During the studies conducted, most of the miRNA molecules in the patients had a different gene expression level than normal, such as miR-451a, miR-144-3p, miR-23b, miR-146a-5p, miR-155-5p, miR-1277-3p, miR-21, miR-106b, miR150-5p, miR320a, miR92a-2-5p, and miR486-3p. These types of miR molecules were involved in patients with disorders and high expression levels. and among the miRs of people with miR-451a, ASD is more involved with clinical performance and is related to social interaction impairment. Other miRNAs, including miR19a-3p, miR-494, miR-142-3p, miR-3687, and miR-27a-3p, were expressed below the normal level in tissue in patients with disorders. and body fluids of patients suffering from this disorder. Therefore, all these miRNAs can be considered candidates for ASD biomarkers. Saliva may be the optimal biological fluid for measuring miRNAs because it is easier to collect from children compared to other biological fluids than to isolate serum or tissue samples. ASD is significantly involved in pathways related to cancer, metabolism (especially steroid biosynthesis, fatty acid metabolism, lysine degradation, and biotin metabolism), cell cycle, and cell signaling (especially Hippo, FoxO, and TGF-?) has been involved.
Conclusion : During the studies conducted, most of the miRNA molecules in the patients had a different gene expression than the normal level, and they can be used as a biomarker.
Keywords : ASD, Nervous decor, microRNA, biomarkers

Count: 401
Abstract ID: 87
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Application of nanoparticle-based platforms in the management of neurological infections

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Infection of the central nervous system (CNS) is a global healthcare concern with high rates of death and disease. CNS infections mainly include meningitis, encephalitis, and brain abscesses. Bacteria, viruses, fungi, protozoa, and parasites are the most common causes of neuroinfections. There are many types of medications used in the treatment of CNS infections, but drug delivery through the blood-brain barrier (BBB) is a major challenge to overcome. The BBB is a specialized multicellular barrier separating the neural tissue from the peripheral blood circulation. Unique characteristics of the BBB allow it to tightly control the movement of ions and molecules. Thus, there is a critical need to deal with these conditions with the aim of improving novel antimicrobial agents. Researchers are still struggling to find effective drugs to treat CNS infections. Nanoparticle (NP)-mediated drug delivery has been considered a profound substitute to solve this problem because NPs can be tailored to facilitate drug transport across the BBB. NPs are colloidal systems with a size range of 1-1000 nm, which can be used to encapsulate therapeutics, improve drug transport across the BBB, and target specific brain areas in CNS infections. A wide variety of NPs has been displayed for the CNS delivery of therapeutics, especially when their surfaces are coated with targeting moieties. This study aimed to review the available literature on the application of NPs in CNS infections.

Keywords : Central nervous system (CNS); antimicrobial drug delivery; bacteria; blood-brain barrier (BBB); infection; meningitis; nanoparticle

Count: 402
Abstract ID: 505
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Reduction of Glutamate Function and Importance in Schizophrenia

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Background and Aim : Schizophrenia is a psychotic disorder that is characterized by significant loss of function and continues to constitute a significant disease burden globally. The disorder is characterized by positive symptoms such as hallucinations, delusions, disorganized behavior, as well as gradual loss of cognitive functions and negative symptomatology. However, there are shortcomings of current antipsychotics. Glutamate is the major excitatory neurotransmitter in the central nervous system. It is the amino-acid with the highest concentration in the brain. Hence, most of synapses use glutamate. Glutamate released in the synaptic cleft from presynaptic terminals stimulates post-synaptic neurons. Re-uptake from the cleft by the excitatory amino acid transporters (EAAT) into astrocytes terminates post-synaptic receptor activation. In the astrocyte, the majority of glutamate is converted to glutamine (Gln) by glutamine synthetase. A smaller proportion is metabolized to alpha-ketoglutarate which enters the Krebs cycle. Glutamine is then transferred back to the presynaptic terminal and converted by glutaminase into glutamate. Glutamate is then repackaged into pre-synaptic vesicles for further neurotransmission. Hence, the glutamate/glutamine cycling through the synapse is intimately linked to aerobic metabolism and accounts for greater than 80% of cerebral glucose consumption. The aim of this study was investigating Reduction of glutamate function and its importance in schizophrenia.

Methods : This review has written the from scientific databases such as Science Direct, Google Scholar, and PubMed.

Results : Glutamate activates G protein-coupled metabotropic receptors (mGluR) and ionotropic receptors. mGluRs modulate cell synaptic transmission via secondary messenger systems and are of three types: group one (mainly post-synaptic, mGluR1 and mGluR5) and groups two (mGluR2 and mGluR3) and three (mGluR4, mGluR6, mGluR7, and mGluR8) are largely presynaptic and regulate glutamate release. Ionotropic receptors are ligand gated ion channels, account for the majority of excitatory neurotransmission and have a key role in synaptic plasticity. They are

divided into three subtypes each with various subunits: NMDA-R (GluN1, GluN2A, GluN2B, GluN2C, GluN2D, GluN3A, and GluN3B); ?-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor (AMPA-R; GluA1, GluA2, GluA3, and GluA4); and kainite receptors (GluK1,2,3,4,5). Each subunit of the metabotropic and ionotropic receptors is encoded by a single gene. NMDA-R have various combinations of subunits compositions. The main NMDA-R includes two GluN1 and two GluN2 subunits. NMDA-R de-sensitize more slowly than AMPA-R and KA-R. NMDAR activation requires: initial activation of an AMPA-R to remove magnesium from a GluN1; occupancy by glycine or D-serine on a GluN1; and binding of glutamate to a GluN2 to allow influx of calcium into the post-synaptic terminal. Ketamine and PCP bind on the transmembrane domain of the NMDA-R resulting in hypofunction.

Conclusion : In summary, genetic, post-mortem and neuro-imaging research support broad glutamatergic abnormalities in the brain of schizophrenia subjects. Some of these abnormalities are consistent with the NMDA-R hypofunction model of schizophrenia and they are not secondary to common clinical confounds. Furthermore, these glutamatergic abnormalities do not correlate with important components of the illness, like positive or negative symptoms or cognitive deficits. However, a glutamatergic model still has heuristic value to guide future research in schizophrenia

Keywords : Glutamate, Schizophrenia, NMDA-R

Count: 403
Abstract ID: 593
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Comparing the Results of Video Head Impulse Test in Patients with Peripheral and Central Vestibular System Tumors

Submission Author: Moslem Shaabani

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Background and Aim : Vestibular Schwannoma (VS) is a lesion in peripheral vestibular system that leads to reduction of Vestibulo-Ocular Reflex (VOR) gain and incidence of corrective saccades. Researches showed that the result of Video Head Impulse Test (VHIT) is positive in peripheral vestibular system disorders and negative in central vestibular system disorders. The aim of this study was to evaluate and compare the results of VHIT in patients with vestibular schwannoma and patients with central vestibular system tumors.

Methods : A descriptive-analytic study was conducted in 15 patients with unilateral VS tumor and 18 patients with unilateral central vestibular system tumors referred to our third party balance clinic. The patients were selected based on diagnosis of neurosurgeon and their complaints of vertigo, imbalance, and dizziness. Assessment of VHIT was performed twice using both horizontal and vertical head impulses. Finally, the value of VOR gain and the corrective saccade ratio were evaluated in two groups. The gain of VOR ≤0.80 was considered as abnormal criterion.

Results : Mean VOR gain in affective side was 0.38 in patients with VS tumor, and 0.96 in patients with central vestibular system tumors (P= 0.001). Moreover, corrective saccades ratio was 30.34 in patients with VS and 3.44 in patients with central vestibular system tumors (P= 0.007).

Conclusion : The results of VHIT can improve differential diagnosis of peripheral vestibular system tumors from central vestibular system tumors.

Keywords : Video head impulse test, vestibulo-ocular reflex, vestibular schwannoma, corrective saccade

Count: 404
Abstract ID: 368
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

The 40 Hz white light emitting diode improves social interactions in a streptozotocin-induced Alzheimer-like model in male rats

Submission Author: Elham Soleimani

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Background and Aim : Alzheimer's disease (AD) is a progressive neurodegenerative disorder that is responsible for approximately 70% of the 24-40 million cases of dementia globally. Additionally, it places a substantial economic strain on healthcare systems. In individuals diagnosed with Alzheimer's disease, symptoms such as apathy, depression, aggression and anxiety manifest prior to the commencement of memory impairment, thereby causing disturbance in interpersonal interactions. The important point is that there is no approved drug for treatment, and the drugs that are currently used to treat the early symptoms of AD only temporarily reduce the symptoms of the disease. Recently, 40 Hz white LED radiation has been introduced as a non-pharmacological and non-invasive approach for the treatment of Alzheimer's disease, which leads to the reduction of beta-amyloid and neurofibrillary tangles. Our aim is to investigate the effect of 40 Hz white LED on social interactions in sporadic Alzheimer's model rat.

Methods : To induce an Alzheimer's model, we employed the intracerebroventricular (ICV) administration of streptozotocin. Following seven days of stereotaxic surgery, the animals were subjected to 40 Hz white LED treatment for a duration of seven days, with each session lasting 15 minutes. Subsequently, the three-chamber social interaction test was conducted 24 hours after the completion of the treatment.

Results : Our findings indicate that light therapy with 40 Hz white LED resulted in enhanced social interaction within an ICV-STZ-induced AD-like rat model.

Conclusion : This study introduces, for the first time, the favorable impacts of light therapy (40 Hz white LED) on the amelioration of impaired social interactions as a psychiatric symptom associated with AD. It is plausible that, in the future, 40 Hz white LED light could be employed as a non-invasive, cost-effective, and easily accessible approach to manage psychiatric symptoms linked to AD, although further investigations are warranted.

Keywords : Alzheimer's disease; streptozotocin; 40 Hz white LED; Social interaction

Count: 405
Abstract ID: 510
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Utilizing Silk proteins as biomaterials suitable for in vitro Blood-Brain Barrier model development

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Background and Aim : The basement membrane surrounding the brain's microvascular endothelial cells is essential in maintaining the blood-brain barrier (BBB) integrity, as it creates a support system for cells of the neurovascular unit (NVU) and the tight junction proteins. Therefore, recreating this element has always been considered essential in designing in vitro BBB models. For this purpose, many synthetic, semi-synthetic, and natural biomaterials are currently being utilized. Here, Bombyx mori domesticated silkworm cocoons were used as a source of protein-based biomaterial for creating a hydrogel cell culture substrate to optimize the culture of the human brain endothelial cell line.

Methods : Silk cocoons were boiled in a solution of Na2CO3 and silk sericin was collected. Degummed cocoons were washed and treated with CaCl2 and Ethanol solution in water, for an hour at 80◦C until dissolved. Sol-gel transition and Beta-sheet formation of fibroin were induced by sonication and incubation at 37◦C. The fabricated hydrogels were sterilized and human microvascular endothelial cells (hCMEC/D3 cell line) were seeded on the surface of both fibroin and sericin hydrogel coatings for 24 hours up to one week. Cell compatibility of the substrate was assessed by MTT assay, surface adhesion was observed by counting the population of cells one hour after seeding, and cell morphology was captured by Dapi and Phalloidin staining. Additionally, sericin was used as a culture media additive to study its effect on the endothelial cells in a scratch assay for 48 hours.

Results : The extraction method combined with the sonication protocol resulted in the gelation of hydrogel in 30 minutes at 37 ?C with a final concentration of 6%(w/v). Silk proteins obtained from silkworm cocoons were fully biocompatible accelerated the surface adhesion of brain microvascular endothelial cells, positively influenced their proliferation, and helped maintain their natural morphology as early as 1 hour after seeding, compared to the untreated surface of cell culture plates. The surface adhesion and proliferation results were comparable to the collagen type I coating of the culture surfaces. The in vitro wound healing assay indicated that a Sericin concentration of 0.05% (w/v) significantly increased the proliferation of the cells after addition to the cell culture media until wound closure was achieved after 48 hours.

Conclusion : Fibroin and sericin have the potential to be utilized as basement membrane substitutes. As the usual go-to substrate for cells of BBB in vitro models, Matrigel is very reliable yet very expensive. Therefore, an efficient solution seems to be finding natural, inexpensive, and customizable biomaterials as a substrate for the basement membrane as a critical constituent of BBB models. Silk proteins have been deemed eligible natural candidates for use in regenerative medicine due to their great biocompatibility and biodegradability, which was further observed in the presented study with the purpose of developing fibroin and sericin hydrogels.

Keywords : Blood-Brain Barrier; Basement Membrane; Protein-based Biomaterial; silk; Brain Microvascular Endothelial Cells

Count: 406
Abstract ID: 502
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Role of autotaxin in the pathophysiology of hepatic encephalopathy at the level of the gut-liver-brain axis: an in vitro and in vivo study

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Background and Aim : Hepatic encephalopathy (HE) is characterized by neurocognitive and neuropsychiatric dysfunctions caused by liver insufficiency with multifactorial pathogenesis that affects more than 40% of cirrhotic patients. Increased circulatory levels of autotaxin (ATX) and lysophosphatidic acid (LPA) have been reported in patients with hepatitis and cirrhosis that were well correlated with the stage of liver injury, however, the potential role of ATX-LPA axis in HE is not yet investigated.

Methods : In vitro ammonia-exposed astrocytes and in vivo mice model of HE were used to conduct the study. C57BL/6 were subjected to two consecutive days of thioacetamide (TAA) injection and daily administration of a potent ATX inhibitor. Mice were also recruited for blood, liver and frontal cortex ammonia levels, LPA concentration and cytokines levels. Histological examination was also performed in samples taken from the intestine, liver and frontal cortex. Hepatic and brain ATX expression and lysophosphatidic acid receptors (LPARs) were also determined by q-RT-PCR. Transmission electron microscopy and Evans blue dye were also used to evaluate the permeability of the blood-brain barrier in mice.

Results : ATX inhibition significantly reduced NH4Cl-induced overproduction of LPA and inflammation in mouse astrocyte cultures. Moreover, plasma and tissue pro-inflammatory cytokines were strongly inhibited by HA130 in mice. Furthermore, the stage of HE was significantly improved by ATX inhibition. The most surprising result was that HA130 alleviated immune infiltrating cells in the liver and intestine and decreased mucus-secreting cells in the intestine. Further analysis showed that the levels of liver enzymes in serum were significantly decreased in response to ATX inhibition. Surprisingly, our data indicated that HA130 could recover permeabilization of the blood-brain barrier, neuroinflammation, and recognition memory.

Conclusion : Taken together, our findings suggest that the ATX-LPA axis contributes to hyperammonemia-induced inflammation in all components of gut-liver-brain axis following HE and could be considered a potential therapeutic target for prevention and treatment of HE.

Keywords : Autotaxin; Hepatic encephalopathy; Neuroinflammation; Hyperammonemia; Gut; Liver; Cerebral cortex

Count: 407
Abstract ID: 474
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

The Effectiveness of Coloring using Mandala Designs on the Cognitive Resilience of High-functioning Adolescents with Autism Spectrum Disorder

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Background and Aim : The present study was conducted with the aim of determining the effectiveness of coloring using mandala designs on the cognitive resilience of high-functioning autistic adolescents. A review of previous research indicates that while numerous studies have been conducted on children with autism spectrum disorder and various interventions to reduce their improve cognitive resilience, there has been no research to date on the effectiveness of coloring with mandala designs on cognitive resilience in high-functioning children with autism spectrum disorder. Additionally, coloring with mandala designs is an intervention that has received less attention from researchers compared to other interventions. Furthermore, in Iran, the studies that have been conducted have mainly focused on variables of anxiety and aggression in children, with little attention to the effectiveness of these interventions on cognitive resilience.

Methods : This research was a semi-experimental intervention with a pre-test, post-test and follow-up design with a control group. The statistical population of this research includes all adolescents with high-functioning autism disorder and studied in the second secondary schools of Tehran in the academic year of 2011-2012. 30 of them who met the criteria for entering the study were selected through available sampling. And they were randomly and equally divided into two groups of 15 people from the experimental and control groups. The experimental group was trained in coloring by the method of mandala designs based on the protocol proposed by Labadi and Ronaghi (2019) in the form of 8 sessions of 1.5 hours, and during this time, the control group remained waiting. The main data of this research was obtained using Conner and Davidson's

resilience (2003). Descriptive statistics and inferential statistics (variance analysis with repeated measurements) were used in data analysis. The results of the research indicated that coloring education using the method of mandala designs is effective on the cognitive resilience of high-functioning autistic adolescents.

Results : The results of the research indicated that coloring education using the method of mandala designs was effective on the cognitive resilience of high-functioning adolescents with autism spectrum disorder.

Conclusion : In conclusion, due to the impact of coloring using mandala designs on the cognitive resilience of adolescents with high-functioning autism spectrum disorder, it is recommended that education packages using coloring activities based on mandala designs would be available to adolescents with autism and their families and schools as a complimentary educational tool in improving the cognitive resilience and of children with adolescents with high-functioning autism spectrum disorder, which as it is indicated in the literature, might be effective on their social skills and academic achievement

Keywords : coloring, cognitive resilience, mandala designs,

Count: 408
Abstract ID: 291
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Retrospective Evaluation of Ventriculomegaly in Fetal Brain MRI Based on Neurological Development in Newborns and Toddlers

Submission Author: Zahra Noori

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Background and Aim : Diagnosing fetal brain anomaly is essential and stressful for patients, because they may set the stage for disability and handicap. These abnormalities are the most prevalent lesions diagnosed on prenatal ultrasound (US), and are accompanied by devastating neurodevelopmental outcomes. Dilated lateral cerebral ventricles in a fetus is called Ventriculomegaly (VMG) which is one of the most common brain abnormalities diagnosed in 2nd trimester of pregnancy. VMG is an important source for diagnosing a wide range of brain abnormalities that cause any disturbance in neurological development. The incidence of this disorder is 1 out of every 1000 live births.

Methods : This study was a retrospective study, and 82 patients who were diagnosed with isolated ventriculomegaly in prenatal ultrasonography and referred for fetal MRI to Faghihi Hospital of Shiraz from April 2013 to December 2017. The mean GA was 27.5 weeks. Neurodevelopment outcome was assessed by five factors (communication, gross motor, fine motor, problem-solving, and personal-social skills) which were included in the Ages and Stages Questionnaire (ASQ). In addition, MRI findings were categorized into positive and negative, and by correlating the ASQ and MRI findings, false positive and false negative MRI data were estimated to predict these results.

Results : A total of 82 cases were s referred for isolated VMG (IVMG) in antenatal sonography and 25 cases were excluded from the study due to the exclusion criteria. According to the alive or aborted/dead cases (out of 57 cases), we had 18 (31.5%) aborted/dead cases and 39 (68.4%) alive cases with follow-up. The mean Rt. and Lt. ventricular sizes in normal ASQ cases (n = 28, Rt: 9.61 mm, Lt: 9.25 mm) were significantly lower than abnormal ASQ cases (n = 11, Rt: 13.16 mm, Lt: 13:61 mm) ($p < 0.05$). According to MRI findings, we had 14 cases with normal MRI images (24.6%), 17 isolated VMG (29.8%), and 26 with anomalies (45.6%) that were categorized into three groups that included; 1. Isolated CNS anomalies (n = 19), 2. Isolated extra CNS anomalies (n = 3) and 3. CNS & extra CNS anomalies (n = 4). Cortical folding abnormalities were the most frequent CNS malformation in MRI of VMG cases. The sensitivity, specificity, and accuracy of MRI were 90.9%, 39.3%, and 53.8% respectively. Besides, our study revealed that ASQ scores in severe VMG were lower than in mild VMG groups ($p < 0.05$).

Conclusion : Our study indicated that the incidence of additional CNS findings is closely related to the size of the ventricles. Moreover, the Rt. and Lt. mean ventricular size in abnormal ASQ cases was higher than in normal ASQ cases. Additionally, MRI has an essential role in the clinical management and neurologic prognosis of fetuses with IVMG in antenatal sonography.

Keywords : Ventriculomegaly; Lateral Ventricles; Fetus; CNS Anomalies; Extra-CNS Anomalies; Neurodevelopment.

Count: 409
Abstract ID: 306
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

The effects of saffron on attention deficit with hyperactivity disorder (ADHD); a systematic review

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Background and Aim : -Inattention is one of the most common symptoms of Attention deficit with hyperactivity disorder (ADHD) in children which is demonstrated as distractibility, straining in sustaining attention on activities, trouble in organizing tasks and activities as well as forgetfulness. Besides the behavioral and psychological treatments, the pharmacological treatment of ADHD consist of stimulants such as methylphenidate (MPH/ Ritalin©), and non-stimulant drugs such as atomoxetine and guanfacine. Crocus sativus ,also known as saffron, as an herbal remedy, is believed to have many beneficial effects such as in ameliorating anxiety and depression and improving memory functions. Saffron might also be useful as an antidepressant agent in alleviating ADHD symptoms. In this study we aim to systematically evaluate the effect of saffron on ADHD.

Methods : -This systematic review was conducted following the PRISMA 2020 statement. A systematic search was conducted in Medline via PubMed, Embase, Scopus, and Web of Science in November 2022 and all interventional studies that investigated the role of saffron, as the main remedy or a supplement, in patients with ADHD were included in this study. Data extraction was conducted using an electronic table in Microsoft Excel by two authors. The certainty of studies

were assessed by Cochrane RoB.2 chosen for the assessment of Randomized Controlled Trial (RCT) studies and the ROBINS-I assessment tool for pre-post intervention study.

Results : -Four articles (three RCTs and a pre-post-intervention study) met our inclusion criteria and were included in this study. A total of 227 patients were included in these studies. Assessing the certainty of the evidence demonstrated a high level of confidence in the results for two studies (Baziar et al., Khaksarian et al.), while suggested a lower level of confidence for two others (Blasco-Fontecilla et al., Pazoki et al.). The results showed an efficient role of saffron as either an adjuvant therapy to MPH or single therapy. The obtained results manifested that the combination of MPH and saffron was found to be more effective. Also, the prescription of saffron can reduce the duration of treatment to 4 weeks and saffron combination therapy with MPH could effectively improve the symptoms of adult patients with ADHD. In addition, no significant difference was found between saffron and MPH in terms of efficacy and side effects in children and adolescents and even saffron tends to be more effective for hyperactivity, improving the number of sleeping hours and making it easier to fall asleep.

Conclusion : This study manifested that saffron has an efficient role as either an adjuvant therapy to MPH or a single therapy for ADHD.

Keywords : Crocus sativus; saffron; attention deficit disorder with hyperactivity; ADHD; systematic review

Count: 410
Abstract ID: 529
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

New insights into the role of oxytocin in Autism Spectrum Disorder: mechanistic roles of this neuropeptide in social behavior

Submission Author: Hadis Kariminejad-farsangi

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Background and Aim : -Autism spectrum disorder (ASD) is a heterogeneous, behaviorally defined neurodevelopmental disorder. Over the past two decades, the prevalence of ASD has progressively increased, however, no clear diagnostic markers and specifically targeted medications for autism have emerged. Autistic patients are often accompanied by complex and diverse clinical symptoms. The main core symptoms are: impaired social communication, cognitive abnormalities, repetitive stereotyped behavior and limited interests. Oxytocin, a mammalian hormone, has been revealed to effectively improve social behavior. This neuropeptide can be secreted form neurons of hypothalamus, paraventricular nucleus and supraoptic nucleus. Oxytocin receptors are distributed in brain regions, including olfactory bulb, piriform cortex, amygdala and lateral septum. Furthermore, Oxytocin is also very important in the regulation of human central nervous system and is generally considered to be closely related to ASD, especially ASD's social defects. The Present review will focus on the research progress of oxytocin and its mechanistic role in improving social behavior in ASD.

Methods : -Different databases (Web Of Science, Pubmed and Google scholar) were searched with the keywords; autism spectrum disorder, oxytocin and social behavior. The resultant articles were gathered and used for writing.

Results : -By binding to its receptors in the brain, oxytocin can affect various brain circuits such as cerebral cortex, thalamus, amygdala, striatum, hippocampus. Also, this hormone affects social behavior by affecting various neurotransmitters such as serotonin and glutamate. Studies have shown that neuroplasticity is also changed by the administration of this neuropeptide and leads to improved social behavior.

Conclusion : Studies have shown that oxytocin can significantly improve social function. Therefore, Oxytocin has been applied to the research field of autism as a possible treatment.

Keywords : Autism spectrum disorder, social behavior, oxytocin

Count: 411
Abstract ID: 324
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

A meta-analysis of the association between the SLC6A3 gene polymorphisms and Attention-deficit/hyperactivity disorder (ADHD)

Submission Author: Ali Soleimani

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Background and Aim : -ADHD (attention deficit hyperactivity disorder) is characterized by age-inappropriate symptoms of inattention, impulsiveness, and hyperactivity. It affects 3%– 8% of school-age children, disrupting academic and social development, and persists into adulthood in 65% of those affected, amounting to 4% of the adult population. Cognitively, children and adults with ADHD have deficits in late-developing cognitive functions, most prominently inhibition, attention, motivation, and timing functions that are known to be mediated by late-developing frontostriatal and cerebellar networks. Many studies have reported an association between DAT1 (Dopamine Transporter 1) and ADHD since this gene encodes for dopamine transporters. ADHD patients have excess dopamine transporters and studies showed that Methylphenidate, which is a drug used for ADHD treatment, had negative effects on dopamine reuptake from pre-synaptic neurons, which ultimately leads to reduced symptoms of ADHD. This study reports the effect of the DAT1 gene on ADHD.

Methods : -Electronic searches were performed using PubMed. In the extensive electronic literature search, keywords “SLC6A3 gene”, “DAT1 gene” and “attention deficit hyperactivity disorder”, “ADHD”, “meta” were searched for prospective studies. The pooled effect sizes (ORs) along with 95% confidence intervals (CIs), in “cases” and “controls” groups for different kinds of polymorphisms and SNPs were calculated. Further subgroup analyses were conducted if the data were available.

Results : -A meta-analysis done with STATA on 36 studies revealed that the SLC6A3 (DAT1) gene has significant effects on ADHD with reported pooled OR of 1.02; 95% CI = (0.96 – 1.06)

and a p-value of 0.00 which rules out the null hypothesis which means that it has significant effect on ADHD. For heterogeneity I2 = 49.47% and H2 = 1.98 which indicates that there is a moderate amount of heterogeneity.

Conclusion : These results overall indicate strong evidence against the null hypothesis. (The null hypothesis is a typical statistical theory that suggests that no statistical relationship and significance exists in a set of given single observed variables, between two sets of observed data and measured phenomena.)

Keywords : SLC6A3, DAT1, attention deficit hyperactivity disorder, polymorphism

Count: 412
Abstract ID: 603
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

A Novel Gamified Approach for Objective Screening of Attention-deficit/hyperactivity Disorder in Children

Submission Author: Zeinab Zakani

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Background and Aim : Objective methods for measuring the symptoms of Attention-deficit/hyperactivity disorder (ADHD) have gained significant interest in recent years. Traditional ADHD evaluation and diagnosis mostly rely on subjective reports from parents and teachers. This study introduces FishFinder, a serious video game designed for smartphones, to provide an objective measurement of ADHD symptoms. This game was inspired by the Continuous Performance Test, one of the most well-known neuropsychological tests for assessing inattention and impulsivity.

Methods : the FishFinder game was designed and developed for smartphones. it was tested on a sample of 26 children diagnosed with ADHD (14 boys and 12 girls) and 26 healthy children (13 boys and 13 girls) aged 5 to 12 years. The Support Vector Machine (SVM) algorithm was used to distinguish children with ADHD from healthy ones.

Results : Out of a total of 18 features related to attention and impulsivity extracted from the child's performance in the FishFinder game, six demonstrated exceptional discriminative abilities in distinguishing ADHD children from healthy ones. The selected features achieved an accuracy of 96.1%, sensitivity of 90%, and specificity of 100% in accurately identifying the respective groups.

Conclusion : The FishFinder game presents a novel and gamified approach for objective ADHD screening in children. By leveraging the power of smartphones, it has a great potential to reach a larger population and provide cost-effective screening which improves early intervention for children with ADHD. This game not only makes the children feel more comfortable and enjoy playing it compared to being assessed by a neuropsychological test in a clinical environment, but also does not need any expertise to be performed.

Keywords : ADHD; Attention-deficit/hyperactivity disorder; Serious game; Screening; Objective method; Artificial intelligence

Count: 413
Abstract ID: 541
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Factors contributing in development of autism spectrum disorders: a case-control study

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Background and Aim : Background and objectives: Several genetic and environmental factors contribute to the occurrence of autism spectrum disorder (ASD). In this study, we evaluated the risk factors of ASD compared to the control group.

Methods : Methods: We conducted a case-control study to include children and adolescents with ASD as the target group and an age and sex matched group of children without ASD as the control group. Patients' parents were asked to provide information on developmental, medical and psychological history, sociodemographic and prenatal/perinatal factors. Multiple logistic regression analysis was conducted to determine factors that are independently associated with the occurrence of ASD and are able to independently predict the occurrence of ASD.

Results : Results: In total, 275 (47.5%) patients with ASD and 304 (52.5%) individuals without ASD (control group) participated in the study. Multivariate analysis showed that higher educational level of fathers and mothers (OR=2.02 and OR=3.48, $p<0.05$ respectively), cesarean delivery (OR=2.42, $p<0.001$), hypertension during Pregnancy (OR=2.68, P=0.018), history of learning difficulties in father (OR=2.2, P=0.021) and mother (OR=2.28, P=0.049) were risk factors for ASD compared to the control group. Also, delays in acquiring the ability to use a spoon (OR=3.36, P<0.001) and to say short phrases (OR=3.31, P<0.001) were associated with the occurrence of ASD later in life.

Conclusion : Conclusion: Current findings showed that prenatal risk factors including high-risk pregnancies and demographic factors of parents can be directly related to the development of autism spectrum disorders. Also, the motor and verbal development of the child in the first months can be valuable signs of autism in the following years.

Keywords : Pervasive developmental disorders, perinatal, prenatal

Count: 414
Abstract ID: 144
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

The role of miRNAs in neurodevelopment and neuropathology of the hippocampus

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Background and Aim : MicroRNAs (miRNAs) are short non-coding and well-conserved RNA molecules that are linked to many aspects of development and disorders. MicroRNAs regulate genes involved in various biological processes and play an important role in the harmonious expression of many genes. During neural development of the central nervous system, miRNAs are regulated in time and space. In the mature brain, the dynamic expression of miRNAs continues, highlighting their functional importance in neurons. The hippocampus is one of the most important brain structures and is a key component of major functional connections in brain. Gene expression abnormalities in the hippocampus lead to disturbance in neurogenesis, neural maturation and synaptic formation. These disturbances are at the root of several neurological disorders and behavioral deficits, including Alzheimer's disease, epilepsy and schizophrenia. There is strong evidence that abnormalities in miRNAs are involved in neurodegenerative mechanisms in the hippocampus through imbalanced activity of ion channels, neuronal excitability, synaptic plasticity and neuronal apoptosis. Some miRNAs affect oxidative stress, inflammation, neural differentiation, migration and neurogenesis in the hippocampus.

Methods : Furthermore, Major signaling cascades in neurodegenerative diseases, such as NF-Kβ pathway, PI3/Akt signaling pathway and Notch pathway, are closely modulated by miRNAs. These observations, suggest that miRNAs are important regulators in the complicated network of gene regulation in the hippocampus. In this review, we focus on the miRNA functional role in the progression of normal development and neurogenesis of the hippocampus. We also consider how miRNAs in the hippocampus are crucial for gene expression mechanisms in pathophysiological pathways.

Results : Research on exosome-based miRNA is promising not only as a miRNA biomarker carrier, but also as a strategy to deliver miRNA-based therapies to the nervous system.

Conclusion : Clearly, the continued advances in this field have the potential to pave the way for future treatments of neurological disorders.

Keywords : MicroRNA, Hippocampus, Neurogenesis, Neural development, Alzheimer's disease, Epilepsy

Count: 415
Abstract ID: 491
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Predicting Theory of Mind level of sophistication using computational modeling and molecular components in autistic and non-autistic children and adolescents

Submission Author: Rana Ghamari

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Background and Aim : As far as social evolution is concerned, Homo sapiens is almost universally acknowledged as a highly social species capable of complex aspects of social functioning. As a basic component of social cognition, Theory of Mind (ToM) is noteworthy. According to the definition of the ToM, it is the ability to attribute others' behaviors to their mental states which are based on social stimuli. Impairment in ToM ability may result in neuropsychiatric symptoms, with autism spectrum disorder (ASD) standing out as a prominent example. Several studies over the past decade have identified the oxytocin receptor gene (OXTR) and its variants as promising components for explaining the molecular mechanisms underlying ToM. Hence, regarding the existing evidence we aimed at predicting ToM level of sophistication using OXTR variants based on social decision making theory and Bayesian modeling.

Methods : Twenty-two children and adolescents with high-functioning ASD (11.318 ± 3.029; five females) and nineteen typically developing (TD) peers (11.578 ± 2.523; five females) were recruited. participants engaged in a repeated dyadic competitive hide and seek game against social and non-social artificial agents with 0-ToM and 1-ToM level of sophistication. Critically, participants were framed to believe either that they were competing against somebody else or that they were playing a gambling game. In the case of genetic variants measurements, two non-coding single nucleotide polymorphisms (SNPs), rs2267498 and rs53576, were genotyped leveraging restriction fragment length polymorphism polymerase chain reaction (PCR-RFLP).

Results : The behavioral results indicated that TD individuals have significantly higher pay off when they were playing against social agents with 1-ToM (p-value = 0.008). Moreover, the

interaction of behavioral and molecular results revealed that in total sample rs53576 AA genotype carriers significantly performed better against social agents with 1-ToM (p-value = 0.038), while in TD group, individuals with rs53576 GG genotype achieved significant higher pay off against non-social agents with 0-ToM and 1-ToM (p-value 0-ToM = 0.006, p-value 1-ToM = 0.039).

Conclusion : In brief, we identified the putative role of OXTR rs53576 in estimating ToM level of sophistication in both autistic and non-autistic subjects. Here, we revealed that rs53576 AA genotype can significantly interact with ToM sophistication against social stimuli, while rs53576 GG genotype can significantly estimate ToM sophistication against non-social stimuli in TD individuals. Further evaluations are required to validate the results of this study.

Keywords : Theory of Mind; Bayesian modeling; social decision making; OXTR; rs53576;

Count: 416
Abstract ID: 635
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

neurofeedback on learning disorder with attention deficit/hyperactivity disorder

Submission Author: امیری اصل Amiriasl

امیری اصل Amiriasl[1], Tahreh Tahan Noozad[2], Maryam mohammadi[3]

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Background and Aim : Background and aim: The aim of this study was to investigate fine motor skills training on self-efficacy, self-control and executive actions of children with spicific learning disabilities.

Methods : Method: The current research was conducted as a semi-experimental study in 1401. The study population included all fourth grade students of Neishabur city. 30 people were selected and placed in two control and intervention groups. The intervention group received eight sessions of fine motor skills training, and the control group did not receive any regular intervention. The participants in both groups completed the Coolidge Executive Performance Questionnaire and the Tanji Self-Control Questionnaire in the pre-test, post-test and follow-up (1 month after the end of the study). The data were analyzed with SPSS software using analysis of variance with repeated measurements.

Results : Findings: The results showed that the average scores of self-efficacy, self-control and executive performance in the intervention group increased compared to the control group in the post-test and follow-up phase ($P<0.001$).

Conclusion : Teaching fine motor skills as an intervention can be one of the effective interventions in school and can be effective in managing academic problems and promoting health.

Keywords : self-efficacy, self-control; Executive function; specific learning disabilities; students.

Count: 417
Abstract ID: 518
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Effectiveness of a cognitive computer game on reading performance of children with reading disorders in the city of Saqqez

Submission Author: Leila Kashani Vahid

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Background and Aim : Students with learning disability, which is neuro-developmental disorder have problems in learning and this problems reflects on their academic performance, and even their self-esteem in life. That is why it is important to be diagnosed and included in the educational planning for these students. The present study was conducted with the aim of comparing the effectiveness of a cognitive computer game on reading performance of children with reading disorders.

Methods : This research was a semi-experimental intervention with a pre-test, post-test and follow-up design with a control group. The statistical population includes all elementary school students who had been referred to learning disability centers in Saqqez city in 1400-1401. To select members, first a list of names of children with reading disorders was prepared, and 30 people were selected among these people, and the subjects were randomly divided into two groups of fifteen people, which included an experimental groups and one control group. The participants of the experiment group received ten 60-minute sessions of computer games intervention. While the control group did not receive any training. Furthermore in order to measure the reading performance of the Nama test (Karami and Moradi, 2017). In all three stages of pre-test, post-test and follow-up, Nama test weas administered for both experimental and control groups. The data were analyzed by the method of variance analysis with repeated measurements through software (SPSS) version 23, at a significance level of 0.05

Results : The obtained results showed that computer games were effective on all the sub-scales of reading performance including In reading words, chain of words, rhyme test, name of the pictures, text comprehension, sound omission, reading pseudowords, test of the letter cues, and test of category cues

Conclusion : It can be concluded that using these kinds of interventions can be effective in improving reading performance of students with learning disability in reading. it is recommended that these games would be available to children with learning disorders and their families and schools as a complimentary educational tool in improving reading performance, which as it is indicated in the literature, might be effective on academic achievement of these children.

Keywords : Cognitive computer games, reading performance, reading disorder.

Count: 418
Abstract ID: 519
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

The effectiveness of play therapy based on cognitive-behavioral approach on resilience and emotional regulation of children with attention deficit/hyperactivity disorder

Submission Author: Leila Kashani Vahid

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3. Assistant Professor, school of Psychology, Shahid Beheshti University

Background and Aim : The present study was conducted with the aim of investigating the effectiveness of play therapy based on the cognitive-behavioral approach on the resilience and emotional regulation of children with attention deficit/hyperactivity disorder.

Methods : The current research was semi-experimental and pre-test-post-test design with a control group. The statistical population of this research includes children with attention deficit/hyperactivity disorder who were 8-11 years old and were referred by a specialist to Khaneh Behi Counseling Center located in the 4th district of Tehran. The research sample in semi-experimental methods is recommended to be at least 15 people. a number of children were excluded from the research project and did not participate regularly in play therapy sessions and due to not completing their homework and reasons. One person was excluded from the research plan and finally 30 people remained in the plan, 15 of them were in the play therapy group and 15 people were in the control group, and they did not enter the training course and did not undergo any other treatment or course during the research. The tools of the current research were Connor and Davidson's resilience scale in 2003, the questionnaire by Gross and John (2003) and the game-based therapy method in 12 sessions. Inferential statistical analysis based on multivariate analysis of variance and independent t test was performed in all statistical steps by spss-26 software.

Results : The analysis of multivariate variance in the intervention and control groups showed a significant difference between the resilience and emotional regulation of children with attention

deficit/hyperactivity disorder in the experimental and the control group (P≤0.05), In summary, due to the impact of play therapy on a group of the scales and the overall score of the resilience and emotional regulation of children with attention deficit/hyperactivity disorder.

Conclusion : It is recommended that educational packages using play- based activities would be available to children with ADHD and their families and schools as a complimentary educational tool in improving the resilience and emotional regulation of children with attention deficit/hyperactivity disorder, which as it is indicated in the literature, might be effective on their social skills and academic achievement

Keywords : Resilience, emotion regulation, hyperactivity/attention deficit, play therapy

Count: 419
Abstract ID: 559
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Comparing the effectiveness of a family-centered musical computer rehabilitation game with visual communication method on hand-eye coordination of children with autism spectrum disorder

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Background and Aim : Children with autism spectrum disorder usually have problems in their hand-eye coordination. The purpose of this study was to compare the effectiveness of family-oriented musical computer rehabilitation, Musicobo, with visual communication method on hand-eye coordination of children with autism spectrum disorder in Amol city.

Methods : Applied research and quantitative data collection method (semi-experimental) which was carried out with a pre-test-post-test and follow-up plan. The research population consisted of all children with autism spectrum disorder from Khorshid Center in Amol city, among whom 45 volunteers (24 boys and 21 girls) were randomly divided into three groups (2 experimental groups and 1 control group). Frastic's motor-visual test (1953) was used. Family-oriented musical application training was implemented in 10 sessions and video communication method (PECS) was implemented in 6 sessions (30 minutes each session).

Results : The results of repeated measurement variance analysis showed that both family-centered musical computer rehabilitation intervention and visual communication method improve hand-eye coordination, of children with autism spectrum disorder and this effect on the effect of time is consistent (p=0.001). Ben Feroni's test showed that the effect of family-centered musical computer rehabilitation was greater than the visual communication method (p=0.001).

Conclusion : Therefore, it was suggested that the use of family-oriented musical computer training should be used in education centers and autism treatment clinics to improve disorders in children with autism spectrum.

Keywords : Family-oriented musical computer educational program, visual education (PAX), children with autism spectrum disorder, hand-eye coordination.

Count: 420
Abstract ID: 594
subject: Development: Aging
Presentation Type: Poster

Maternal psychological stress during pregnancy and newborn telomere length: a systematic review and meta-analysis

Submission Author: Reza Moshfeghinia

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Background and Aim : -Telomeres protect the ends of chromosomes, and shorter leukocyte telomeres are associated with major group diseases. Maternal psychological stress may be related to the shortening of telomeres in infants. This systematic review and meta-analysis set out to consolidate the varying effect sizes found in studies of maternal psychological stress and telomere length (TL) in newborns and identify moderators of the relationship between stress during pregnancy and newborn TL.

Methods : -Our systematic review was registered in Prospero. Six databases (PubMed, Scopus, Embase, PsycINFO, Web of Science, and CINAHL Complete) were searched for records in English from inception to February 10, 2023. Observational studies were included that measured the relationship of psychological stress of the mother during pregnancy on the TL of the newborn. The Newcastle–Ottawa quality assessment scale was used to assess the quality of the included studies. A random-effect model was selected. Statistical analysis performed by Stata software version 17.

Results : -Eight studies were included for qualitative and four for quantitative analysis. There was an inverse statistically significant relationship between maternal stress and newborn TL; A one score increase in maternal psychological stress resulted in a 0.04 decrease in the TL of the newborn (B= -0.04, 95% CI= [-0.08, 0.00], p=0.05). Selectivity analysis showed that the pooled effect size was sensitive to one study; After removing this study, the pooled effect size remained significant (B= -0.06, 95% CI= [-0. 10, -0.02], p<0.001)

Conclusion : Physiological and environmental factors can significantly affect the TL of newborns. Our results support a significant impact of maternal psychological stress on the TL of a newborn. This association demonstrates the significance of stress in influencing the telomere length, which can be a contributing factor in the infant's future. Therefore, recognizing this association is crucial for understanding and addressing potential health risks and necessitates the need for additional future studies to validate our findings.

Keywords : telomere shortening, telomere, maternal stress, pregnancy, newborn.

Count: 421
Abstract ID: 653
subject: Development: Other
Presentation Type: Poster

Notch Signaling Functions on Neural Stem Cells Proliferation and Differentiation

Submission Author: Arya Moftakhar

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Background and Aim : The Notch signaling pathway is significantly involved in neural development regulation, as well as in the regulation of glia cells, and also CNS-related neurological disorders. Notch signaling has a major role in dividing the ectoderm development into non-neural and neural tissues. Various studies revealed that Notch signaling is repeatedly associated with multiple developmental decisions within the nervous system.

Methods : This study was directed in the database of PubMed, Google Scholar and Sci-Hub from April 2002 to June 2023, by searching for keywords comprising Notch signaling, neural stem cells (NSCs), and stem cells' fates, in title and abstract. Inclusion criteria encompassed most of the studies published in English that investigated different pathways of Notch signaling, and its impacts on neural stem cells.

Results : Through multiple pathways Notch has different interactions with various molecules, such as AAK1, miR-124, BMP4, and LIF, to apply its impacts on neural stem cell lines, comprising proliferation and differentiation. Moreover, there are other genes or proteins that are able to affect NSCs through regulating Notch. For instance, miR-342-5p can inhibit the Notch signaling to decrease the NSCs' differentiation.

Conclusion : Notch signaling has a chief role in the astrocytic differentiation of adult and embryonic neural stem cells. Different combinations of Notch ligands and receptors can promote self-renewal, differentiation, and maintenance of progenitor and stem cells, including neural stem cells. Furthermore, Notch signaling regulates somatic stem cells' both quiescent and active states. In general, these pathways require further studies, to find out new treatment methods for conditions such as spinal cord injury.

Keywords : Notch signaling; Neural stem cells; Neurological disorders

Count: 422
Abstract ID: 295
subject: Development: Other
Presentation Type: Poster

Study of Human Fetal Cerebral Sulcai Development in an Autopsy Specimen

Submission Author: Mojde Pajokh

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Background and Aim : The cerebral sulci are principle micro-anatomical structures with symmetrical development in both cerebral hemisphere, and its sequential appearance synchronous with fetus gestational age. Early detection of defects in number, appearance and symmetry of various sulci in both fetal cerebral hemispheres is of paramount importance, the malformation of normal sulci pattern may lead to speech defect or language problem during post natal life. The first and second trimesters of human fetal brain development coincides with neurons migration to the surface brain layer, which is done around the 20th weeks gestational age (GA), then folding of the immature sulci and gyri happens. The 20th week GA is at mid-gestation and corresponds to the termination of pregnancy in several countries and around this time premature babies may survive. Despite this, there is little information about the exact anatomical characteristics of brain sulci at this GA that is evaluated in the current study.

Methods : Fetus sample of 20th gestational weeks was obtained from Kashani Hospital and fixed in 10% formalin. The specimen obtained from a spontaneous abortion without congenital anomalies after obtaining parental written consent. Cerebrum was removed with scalp and skull reflection through a cruciate incision, then meninges were removed to evaluate the sulci on the supero-lateral, medial and inferior surfaces of cerebrum and photographs were taken.

Results : The brain sample that removed from a 20 weeks human fetus, was examined in terms of formation of cerebral sulci on the supero-lateral, medial and inferior surfaces of hemisphere. The most distinct sulci at this age on the supero-lateral surface of hemisphere were lateral sulcus (sylvian fissure) and superior frontal sulcus, and on the medial aspect, cingulate sulcus, ramus of cingulate sulcus, parieto-ocipital and Calcarine fissure were prominent. In the inferior surface of hemisphere, the orbital and olfactory sulcui were detectable.

Conclusion : All cerebral surfaces sulci are formed during fetal life and the manifestation of each sulcus follows a characteristic timing pattern, that can be used as reliable guides to estimation of gestational age and normal fetal development.

Keywords : Cerebral cortex; Fetus; Sulcus; Development

Count: 423
Abstract ID: 142
subject: Development: Other
Presentation Type: Poster

Investigating the Therapeutic Potential of Dimethyl Fumarate (DMF) on Bone Marrow Mesenchymal Stem Cells (BM-MSCs): A Molecular Analysis

Submission Author: Maryam Hassanpour

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4. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

Background and Aim : Stroke is a leading cause of mortality and disability in adults worldwide. While the therapeutic potential of stem cells and their derivatives for ischemic stroke has been explored, challenges such as drug availability, ethical concerns, and cell viability remain significant obstacles. Dimethyl Fumarate (DMF) has garnered attention for its potential in regenerative medicine, specifically in the context of neurotrophic factor modulation.

Methods : In this study, we explored the impact of various DMF concentrations on BM-MSCs, ultimately identifying an optimal concentration of 1 micro molar DMF. Subsequently, BM-MSCs were cultured with this selected concentration, and their gene expression profiles were analyzed using Real-Time PCR (RT-PCR).

Results : Our results revealed a striking increase in the expression levels of Brain-Derived Neurotrophic Factor (BDNF), Nerve Growth Factor (NGF), and Neurotrophin-3 (NT-3) upon DMF treatment, signifying their potential in enhancing neuronal support and regeneration. Conversely, Glial-Derived Neurotrophic Factor (GDNF) transcript levels were markedly reduced, suggesting a prominent role for DMF in neuroprotective mechanisms.

Conclusion : These findings shed light on the therapeutic promise of DMF in modulating neurotrophic factors within BM- MSCs, offering novel insights into its application in regenerative medicine for neurodegenerativeconditions.

Keywords : Bone marrow mesenchymal stem cells - Dimethyl fumarate - Gene expression - neurotrophic factors

Count: 424
Abstract ID: 103
subject: Development: Other
Presentation Type: Poster

Evaluating the Potential of Postnatal Cerebrospinal Fluid Induction for Dopaminergic Neuron Generation in Hair Follicle Stem Cells

Submission Author: Najme Golchinfard

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Background and Aim : The dopaminergic system plays a crucial role in maintaining the balance of the nervous system by regulating the production of the neurotransmitter dopamine. Disruptions in dopamine synthesis pathways have been associated with various neurodegenerative diseases. This study aimed to investigate the capacity of hair follicle stem cells (HFSCs), which originate from the neural crest, to differentiate into dopaminergic neurons. Specifically, we explored the potential of cerebrospinal fluid (CSF) in inducing dopaminergic neuron generation, prompted by the presence of proteins and transcription factors in CSF supporting this hypothesis.

Methods : To accomplish this, CSF was collected from rat pups on the 5th day post-birth. HFSCs were isolated, characterized, and subsequently treated with the collected CSF. After 72 hours of treatment, we conducted the MTT assay to assess cell proliferation. Additionally, the morphology of the treated stem cells was evaluated via crystal violet staining 12 hours post-treatment. Real-time PCR was employed after 72 hours of treatment to determine the expression of dopaminergic, neuronal, and glial markers.

Results : Results from the MTT assay and morphology assessment indicated no significant differences between the control group and the cerebrospinal fluid treatment group. However, the real-time PCR results revealed a notable increase in the expression of NR4 and PDGFR? genes. On the other hand, the expression of TH and MAP2 genes remained consistent with the control group, displaying no significant differences. In contrast, the expression of DDC and ?-Tubulin genes decreased compared to the control group.

Conclusion : In conclusion, the findings from the MTT assay, morphology assessment, and real-time PCR analysis did not lead to the advancement of HFSCs toward dopaminergic neuron differentiation. Furthermore, the gene expression levels did not reach a significant threshold to activate crucial genes involved in the dopamine synthesis pathway.

Keywords : Cerebrospinal Fluid ; Hair follicle stem cells ; Neural crest ; dopaminergic neurons

Count: 425
Abstract ID: 91
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Investigating the analgesic and anti-inflammatory effects of the ethanolic extract of Suaeda aegyptiaca fruit in an animal model

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Background and Aim : Suaeda aegyptiaca is found in some parts of Iran. Previous reports on this plant have mentioned antimicrobial, anti-inflammatory and antioxidant properties.

Methods : Ethanol extraction of Suaeda aegyptiaca fruit was done by soaking method. In this study, 36 rats and 60 mice were used in groups of 6. In the tests to investigate the analgesic effect of hot plate model and peritoneal acetic acid injection model, in each model there are 6 groups including: negative control group (carrier), positive control group (morphine) and hydroalcoholic extract 50,100,200,300 mg/kg by injection intraperitoneally and in tests to investigate the anti-inflammatory effect of carrageenan model, 6 groups including: control group, positive negative group (mefenamic acid) and hydroalcoholic extract 50, 100, 200, 300 mg/kg were studied. Also, in the cotton pellet model, the studied groups including: negative control group (carrier), positive control (indomethacin) and hydroalcoholic extract 50, 100, 200 mg/kg were studied.

Results : According to the results obtained from the hot plate test, the plant in doses of 50 and 100 mg/kg showed a significant analgesic effect compared to the control, and this pain reduction was equivalent to morphine. Based on the results of the writing model, the extract showed peripheral and visceral analgesic effects in all three studied doses, so that the inhibition percentage of abdominal distention with doses of 50, 100, 200 mg/kg of the extract was 53, 54 and 49%, respectively, in comparison with the morphine group. was 97%. The acute anti-inflammatory effect of the extract was evident in the dose of 300 mg/kg, although this effect was observed in the

doses of 50 and 100 mg/kg with a delay and after 2 hours. The best effective time of the extract in all doses was in the third hour of the induction of inflammation by carrageenan, and the percentage of inhibition of inflammation with doses of 50, 100, 200, 300 mg/kg extract was 32, 37, 48 and 36%, respectively, in comparison with the mefenamic acid group. was 70%. The plant extract had no significant anti-inflammatory effect in any of the doses in the chronic inflammatory model compared to the control group.

Conclusion : : Based on the data of this study, the ethanolic extract of Suaeda aegyptiaca fruit has more analgesic effects, especially visceral analgesia, and the anti-inflammatory effects of the extract are limited and transient.

Keywords : Suaeda aegyptiaca plant; anti-inflammatory; analgesic; ethanolic extract; mouse; rat

Count: 426
Abstract ID: 102
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

The effect of periaqueductal gray's metabotropic glutamate receptor subtype 8 activation on locomotor function following spinal cord injury

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Background and Aim : The pathophysiology of spinal cord injury is very complex. One of the debilitating aspects of spinal cord injury in addition to pain is a defect in motor function below the lesion surface. In this study, we tried to assess the modulatory effect of (S)-3,4-Dicarboxyphenylglycine (DCPG), a metabotropic glutamate receptor subtype 8 (mGluR8) agonist, on animal's locomotor functions in a model of compression spinal cord injury.
Methods : We used a contusion method (T6-T8) to induce spinal cord injury. Male Wistar rats were randomly assigned to five equal groups (n = 10 per group). Clips compression injury model was used to induce spinal cord injury. Three weeks post injury DCPG, siRNA (small interfering Ribonucleic Acid), and normal saline (vehicle) were administered intra-ventrolaterally to the periaqueductal gray (PAG) region. Motor functions were assessed through BBB (Basso, Beattie, and Bresnahan Locomotor Rating Scale) and ladder walking test. In addition, the effects of DCPG on axonal regeneration in the corticospinal tract was evaluated.
Results : We found that DCPG could improve motor function and axonal regeneration in the corticospinal tract when compared to the siRNA group.
Conclusion : The results revealed that the activation of mGluR8 in PAG is capable of improving motor function and of axonal regeneration due to the inhibitory effect on glutamate transmission on the spinal cord surface and also the elimination of the deleterious effect of glutamate on the regeneration of the injured area as an excitatory neurotransmitter.
Keywords : mGluR8; central neuropathic pain; spinal cord injury; periaqueductal gray; locomotor function

Count: 427
Abstract ID: 380
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Neuroprotective effect of cerium oxide nanoparticles in a rat model of neuropathic pain

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Background and Aim : Neuropathic pain triggered by peripheral nerve lesion is extremely difficult to manage with current approaches. Recently, several studies using nanoparticles suggested a new way to control the neuropathic pain. This study is intended to explore the potential neuroprotective effect of Cerium Oxide Nanoparticles (CNPs) with synthesized by pullulan in neuropathic pain in rats.

Methods : On the right common sciatic nerve of male Wistar rats, the chronic constriction injury (CCI) procedure was used to establish a neuropathic pain model. CNPs was injected into the caudal vein of the rat. Animal behavioral responses have been measured to detect mechanical allodynia, cold allodynia, and thermal hyperalgesia. The levels of tumor necrosis factor (TNF)-α, and interleukin (IL)-1β, nitric oxide (NO), Malondialdehyde (MDA), and total thiol were measured in the spinal cord segment of rats as an index of inflammation and oxidative stress.

Results : Results indicated that creation of CCI increases behavioral responses as significant, which improved when the rats were administered CNPs. Spinal cord specimens of CCI rats had elevated inflammation and oxidative stress status (↑IL-1β, ↑TNF-α, ↑NO, ↑MDA) and decreased antioxidative level (↓total thiol). In CNPs -treated rats, these changes were reversed.

Conclusion : Our study concluded the CNPs have a protective effect against the development of neuropathic pain.

Keywords : Cerium Oxide Nanoparticles, Neuropathic Pain, Oxidative Stress, Neuroinflammation, Chronic pain, Pullulan

Count: 428
Abstract ID: 386
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Comparison of tDCS and Sham tDCS in pain intensity and improvement of symptoms in patient with shoulder tendinopathy

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Background and Aim : Due to the high prevalence of shoulder pain and the presence of rotator cuff tendinopathy as one of its main causes, in this study we evaluated the effectiveness of tDCS and compared it with the control group in patients with rotator cuff tendinopathy.

Methods : The patients are treated with tDCS or control by simple randomization and block randomization in one of the two groups. Treatment is done in 5 sessions. The duration of using tDCS will be 20 minutes and the duration of using Sham will be only 30 seconds. Patients before the intervention, immediately after the end of 5 sessions and three months after the end of the sessions are evaluated for pain by VAS score, quality of life by QOL-BREFF questionnaire and performance with DASH questionnaire. The results obtained from this Items will be compared between two groups.

Results : In this study, 26 patients were intervened and the mean age of patients in the study was 53.48 11 11.21 years. Thirteen people were in the tDCS group and 13 in the control group. The mean VAS score of patients in both tDCS and control groups decreased and this decrease was significantly different between the two groups only in night VAS score (P = 0.021). The amplitude of all flexion, extension, abduction and adduction movements in the tDCS group improved significantly during three months, but there was no significant difference between the two components for extension movements.

Conclusion : Although tDCS can have effects on improving pain and range of motion in patients with rotator cuff tendinopathy, the effects seen in tDCS were not significant compared to the control group.

Keywords : tDCS, sham tDCS, rotator cuff tendinopathy,pain

Count: 429
Abstract ID: 634
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Switchman Hypothesis; A Novel Therapy Based on Trigeminal Nerve Stimulation by Sneezing for Management

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Background and Aim : Several lines of evidence have shown that trigeminal nerve plays a central role in pathogenesis of the migraine headache. In the current study we are trying to provide an effective treatment for management of migraine headache based on Switchman Hypothesis of the trigeminal nerve.

Methods : We hypothesized that trigeminal nerve stimulation will result in decreased number and severity of the migraine headache attacks. In this hypothesis, trigeminal nerve is like train railways that a switchman is on the way; that is why it can only transfer one neural message at once.

Results : We share the experience of two patients with chronic migraine headache who used pepper to suppress their attacks. Each patient experienced suppressed migraine headache in 72% and 87% of the attacks and the intensity of the pain was extremely lower in the rest of the attacks.

Conclusion : The Switchman Hypothesis could be an effective and safe therapeutic basis for developing targeted therapies for migraine headache and attacks. Further clinical studies are required to shed light on the issue and evaluate the safety and efficacy of different modalities.

Keywords : Migraine headache; Trigeminal nerve; Switchman Hypothesis; Management; Pathophysiology

Count: 430
Abstract ID: 665
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Oral

Acamprosate effect on neuropathic pain in rats: With emphasis on the role of ERK/MAPK pathway and SCN9A sodium channel

Submission Author: Fateme Mehrabi

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Background and Aim : Neuropathic pain is a chronic pain owing to nerve damage or diseases of the central nervous system (CNS). The expression of SCN9A, which encodes the Nav1.7 voltage-gated sodium channel and ERK have been found to change significantly in many cases of neuropathic pain. Here, we investigated effects of acamprosate on neuropathic pain, taking into account the crucial roles of SCN9A, the ERK signaling pathway, and inflammatory markers in a rat model of chronic constriction injury (CCI).

Methods : Acamprosate (300 mg/kg) was injected intraperitoneally (i.p.) for 14 days. The tail-immersion, acetone, and formalin tests were used to determine behavioral tests such as heat allodynia, cold allodynia, and chemical hyperalgesia, respectively. Lumbar spinal cord was extracted and processed for Nissl staining. The amount of spinal SCN9A expression and ERK phosphorylation were examined using ELISA assay.

Results : The expression of SCN9A, ERK, inflammatory cytokines (IL-6 and TNF-α), allodynia and hyperalgesia significantly increased on days 7 and 14 following CCI. The treatment not only reduced neuropathic pain but also blocked CCI's effects on SCN9A upregulation and ERK phosphorylation.

Conclusion : This research demonstrated that acamprosate reduces the neuropathic pain induced by CCI of the sciatic nerve in rats by preventing cell loss, inhibiting spinal SCN9A expression, ERK phosphorylation, and inflammatory cytokines, suggesting potential therapeutic implications of acamprosate administration for the treatment of neuropathic pain.

Keywords : Acamprosate, SCN9A sodium channel,neuropathic pain

Count: 431
Abstract ID: 461
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Calcium dobesilate protects against D -galactose-induced hepatic and renal dysfunction, oxidative stress, and pathological damage

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Background and Aim : Calcium dobesilate (CaD) is used for the treatment of diabetic retinopathy and nephropathy. This agent exerts antioxidant effects. In the present study, we evaluated the protective effects of oral administration of CaD against hepatorenal damages in a mice model of aging induced by D -galactose (D - gal)

Methods : We used 28 male albino mice, which equally and randomly were divided into four groups as follows: intact, aging (D-gal at the dose of 500 mg/kg, p.o.), aging + CaD 50 (D-gal plus CaD at the dose of 50 mg/kg), and aging + CaD 100 (D -gal plus CaD at the dose of 100 mg/kg, p.o.). All drugs were administered orally once a day for 42 days. The liver and kidney damages were evaluated by measuring mass indices, levels of serum creat- inine and blood urea nitrogen, and activities of serum alanine aminotransfer- ase, aspartate aminotransferase, and alkaline phosphatase and by histopathological evaluation. Moreover, hepatic and renal tissue oxidant/ antioxidant markers (malondialdehyde, superoxide dismutase, catalase, and glutathione peroxidase) were measured.

Results : The results showed that D -gal treatment induced significant oxidative stress in the kidney and liver that was paralleled by dysfunctions and histological alterations of these organs. CaD significantly improved the liver and kidney indices, implemented func- tional capacity of the liver and kidney, as well as decreased oxidative stress enhancing antioxidative enzyme activities. CaD treatment also inhibited the development of histological alterations of both kidney and liver.

Conclusion : CaD might represent a promising therapeutic agent for the attenuation of hepatorenal injuries induced by aging.

Keywords : aging; calcium dobesilate; kidney; liver; mice;oxidative stress

Count: 432
Abstract ID: 104
subject: Pain and Sensory Systems: Vision
Presentation Type: Poster

Investigating the anti-inflammatory and analgesic effect of Prosopis cineraria in experimental animals

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Background and Aim : According to new research approaches in the direction of using complementary medicine, especially herbal medicine, as a treatment with low cost and minimal side effects, this study was conducted with the aim of investigating the anti-inflammatory and analgesic effect of the Prosopis cineraria in exprimental animals
Methods : In this experimental and (interventional) study, 66 male rats (weight range 180-190 grams) were included in 11 groups. Carrageenan 2% and Writhing tests were used to measure the anti-inflammatory effects of Prosopis cineraria in doses of 300, 200, 100 mg/kg, and hot plate tests and granuloma model were used to measure the analgesic effects. Next, the obtained data were measured in Prism software version 9.5.1.
Results : The findings obtained from the present study showed that the analgesic effects of Prosopis cineraria were not effective in all three studied doses (100, 200, 300 mg/kg). However, in the visceral pain model (Writhing test), doses of 200 mg/kg and 300 mg/kg showed similar effects to 5 mg/kg morphine. In the acute inflammatory pain model (carrageenan test), all three therapeutic doses of Prosopis cineraria showed anti-inflammatory effects similar to mefenamic acid 30 mg/kg. However, in the model of inducing inflammation caused by granuloma tissue (chronic anti-inflammatory effects), none of the therapeutic doses of Prosopis cineraria could work better than the control group and in all cases the anti-inflammatory effect of indomethacin 5 mg/kg was superior to all groups.
Conclusion : Prosopis cineraria in doses of 300 and 200 mg/kg can be used as a safe and alternative therapeutic approach in the management of acute pain and inflammation.
Keywords : anti-inflammatory effects, analgesic, Prosopis cineraria.

Count: 433
Abstract ID: 10
subject: Pain and Sensory Systems: Auditory and Vestibular
Presentation Type: Poster

Animal models of tinnitus: a review of pharmacological and noise methods

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Introduction: Tinnitus is the experience of constant, phantom sound in ears or head that cannot be explained by any external source. It is a symptom of various disorders that affects the quality of life of millions people. Despite its huge personal and anticipated economic impact, tinnitus still has no effective treatment because its physiological and pathological mechanisms are poorly understood. Since it is not possible to examine the cellular-molecular mechanisms of tinnitus development and stability in humans, animal models have been utilized to provide some insight into these processes. This article reviewed the modeling and mechanisms of tinnitus with ototoxic drugs and loud noise as two common methods of tinnitus induction in animals. Method: This article is based on articles published during 2000-2023 in which keywords such as "tinnitus", "ototoxic drugs", "salicylate", "noise" and "animal model" were used. These articles were searched in databases such as Science Direct, Google Scholar, PubMed, and Scopus. Results: Studies show that laboratory animals can able to experience tinnitus and associated behavioral impairments. It can be induced in animals through the same procedures that cause in human, such as exposure to loud noise or ototoxic drugs. In both tinnitus induction methods, the structural changes initiated from the cochlea and continued to cortex that it reflect the extent of the affected regions in the creation, development, and preservation of tinnitus. However, a majority of studies conclude that salicylate is the better pharmacological method; with significant benefits over noise induction. Salicylate injection is a valid method to induce transient tinnitus in animals with fewer changes compared to noise exposure and in a shorter time interval (5 hours vs. 8 weeks). As well as, salicylate is a fast and reversible tinnitus inducer that also permits research into the physiological changes that occur just before, during, and after tinnitus onset. Nevertheless, salicylate has the potential to create tinnitus in both ears, which is a big drawback. Fortunately, loud noise can induce either unilateral or bilateral tinnitus, so it may be possible to study the associated changes in either ear. Conclusion: Studying the underlying molecular causes of brain alterations in tinnitus is an unfamiliar and exciting area of study. Animal models of tinnitus have allowed researchers to explore hypotheses about its origins, leading to the creation of interventional therapies for its treatment.

Keywords : tinnitus, ototoxic drugs, salicylate, noise, animal model

Count: 434
Abstract ID: 322
subject: Pain and Sensory Systems: Auditory and Vestibular
Presentation Type: Poster

Vagus nerve stimulation for treatment of tinnitus: A review and perspective

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Introduction: Subjective tinnitus, one of the most frequent ear complaints patients experience, can be so debilitating that it can even lead to thoughts of suicide. Tinnitus can make it difficult to follow conversations, focus on tasks, appreciate pleasant sounds, or get a good night's rest. But at the moment, there is no known cure for tinnitus. The stimulation of the vagus nerve is an innovative approach with potential benefits for the treatment of tinnitus. The purpose of this article is to review the literature on vagus nerve stimulation (VNS) and its potential impact on tinnitus-related discomfort and symptom severity. Method: Relevant studies were retrieved from the Science Direct, Google Scholar, PubMed, and Scopus databases with keywords such as "tinnitus", "vagus nerve stimulation", "VNS", "tVNS" and "electrical stimulation" from 2010-2023. Results: The results showed that there were two main methods by which the vagus nerve was stimulated in research aimed at treating tinnitus: surgically and non-surgically. Furthermore, some studies used sound therapy alongside VNS, whereas others did not. VNS has been utilized in some research to treat depression and related diseases. Additionally, some studies have shown that VNS is useful in reducing tinnitus symptoms, including desperation and anxiety. Animal studies revealed that a combination of VNS and sound therapy can change neural plasticity in the auditory cortex. These studies show that coupling VNS with non-tinnitus sounds leads to changes in the tonotopic map of the auditory cortex. As well, some clinical research showed the efficacy of a combination of VNS and sound therapy for tinnitus. Overall, clinical investigations have indicated a moderately beneficial effect on tinnitus loudness perception and a clinically meaningful reduction in tinnitus distress. Conclusion: It is believed that many types of tinnitus are caused by defective neural circuits and that VNS can provide the specificity needed to restore normal neural activity in these circuits. Cortical plasticity is significantly influenced by the cholinergic and noradrenergic systems of the forebrain. These neuromodulatory pathways are known to be activated by VNS. However, a great deal of research is still required to fully comprehend the neurological basis of tinnitus and to create individualized therapy to alleviate the discomfort associated with this multifaceted disorder.

Keywords : Tinnitus, Vagus Nerve Stimulation, VNS, tVNS

Count: 435
Abstract ID: 40
subject: Pain and Sensory Systems: Chemical Senses: Olfactory and Taste
Presentation Type: Poster

Investigating the effect of aqueous extract of saffron stigma on the analgesia and hyperalgesia effects of morphine in Drosophila melanogaster larvae

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Background and Aim : Saffron has been useful in the treatment of many diseases. this research investigates the effect of aqueous extract of saffron stigma on analgesia and hyperalgesia caused by morphine.

Methods : Here, chemical pain test (Writhing) in 0, 10, 20, 30, 40 and 50% acetic acid and thermal pain test (Hot plate) at temperatures 35, 38, 41, 44 and 47 degree of Celsius were used in third instar Drosophila larvae (n = 10). First, the larvae were raised in the environment containing different concentrations of aqueous extract of saffron stigma (10, 20 and 40 mg/lit) and to induce analgesia and hyperalgesia, morphine (10 mg/lit) and very low concentration (0.0001 mg/lit) of morphine were received respectively half an hour before pain tests. Statistical analyses were performed with Graphpad Prism software.

Results : Unlike the thermal pain model, the extract itself, especially at a concentration of 40 mg/lit, reduced the twisting movements of the larvae in the chemical pain model (analgesia) ($p < 0.001$). Morphine 10 mg/lit also caused analgesia ($p < 0.001$) and hyperalgesia at a very low concentration of 0.0001 mg/lit ($p < 0.001$). The simultaneous presence of extract (40 mg/lit) and morphine (10 mg/lit) increased analgesia ($p < 0.05$). and also eliminated the effect of hyperalgesia caused by a very small concentration of morphine ($p < 0.05$).

Conclusion : The presence of aqueous extract of saffron stigma not only produced a chemical analgesia effect in the larvae, but also strengthened the analgesia effect of morphine and inhibited the hyperalgesia effect caused by its very low concentration. Perhaps saffron has a synergistic effect with morphine which involved with opioid receptors that has strengthened the analgesia of

morphine. on the other hand, along with the function of reversing the hyperalgesic effect of morphine by the extract, these can induce the idea of researching the simultaneous use of saffron and morphine for pain management In patients who need to use morphine to reduce the amount of morphine required and the chance of addiction.

Keywords : saffron (Crocus sativus); morphine; analgesia; hyperalgesia; Drosophila melanogaster; addiction

Count: 436
Abstract ID: 29
subject: Pain and Sensory Systems: Multisensory Integration
Presentation Type: Poster

Investigation of the Tagetes erecta (Marigold) leaf hydroalcoholic extract effects on chemical and thermal pain in Drosophila melanogaster

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Background and Aim : The sensation of pain, known as nociception, is crucial for animals to detect and respond to potentially harmful situations, ensuring their survival. Recent studies have shown that Tagetes erecta (Marigold) may be effective in preventing coronary artery disease, improving immune response, and reducing the risk of cancer, as well as treating stomach pain, liver problems, respiratory diseases such as colds, flu, bronchitis, and gynecological issues. Additionally, the essential oil of this plant has been found to have antioxidant activity. In this study, we investigate the potential pain-relieving properties of Marigold leaf extract on thermal and chemical pain in Drosophila melanogaster.

Methods : This study employed the writhing method to measure the chemical pain threshold of Drosophila melanogaster larvae. Multiple groups of larvae were exposed to varying concentrations of Marigold hydroalcoholic leaf extract (50, 100, 200 mg/lit) and then subjected to 0, 10, 20, 30, 40, and 50% acetic acid concentrations to assess the extract's anti-pain effect. Thermal pain thresholds were measured using the hot plate method for both larvae and adult Drosophila melanogaster. The larvae and adult flies were cultured in various concentrations of Marigold leaf hydroalcoholic extract (50, 100, 200 mg/lit) and placed on a hot plate at 35, 38, 41, 44, and 47 centigrade temperatures. The number of c-shaped movements of the larvae during 1 minute and the longest accommodation time on a hot plate before the first jump of adult Drosophila melanogaster were recorded.

Results : The results of this study indicate that the use of Marigold leaf hydroalcoholic extract may have an analgesic effect. Specifically, Drosophila melanogaster larvae exposed to the highest concentrations of the plant extract exhibited a reduced number of c-shaped movements in response

to acetic acid ($p<0.001$), while adult flies exposed to the highest concentration of the extract demonstrated the longest accommodation time on the hot plate before the first jump($p<0.001$).

Conclusion : These findings suggest that the extract may have potential as a pain-relieving agent. Further research is needed to identify the specific compositions within the extract responsible for its effects and to determine whether these compositions are safe for human consumption. Overall, these results provide promising evidence for the potential therapeutic benefits of Tagetes erecta leaf extract in pain management.

Keywords : Analgesia, Thermal pain, Chemical pain, Tagetes erecta, Hydroalcoholic extract, Drosophila melanogaster

Count: 437
Abstract ID: 165
subject: Pain and Sensory Systems: Sensory and Sensory Integration Disorders
Presentation Type: Poster

Nitric oxide modulates short and long-term changes in hyperalgesia induced by empathy

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Background and Aim : Pain is perceived not only by personal experience, but also vicariously through social communication and interaction. Though it has been considered as a human feature, recent studies have demonstrated empathy-like behaviors in other animals including rats.

Methods : We used adult male Wistar rats (n=8 for each group). One sibling received formalin injection into the hindpaw five times within a nine-day period and the other sibling observed the pain while being pretreated with saline, L-NAME or L-arginine (10 mg/kg, i.p.). 24 h and 7d after the last observation nociception were evaluated.

Results : Observing a sibling in pain led to a hyperalgesia in the observer 24 h and 7d after the last observation. Nitric oxide system modulated these changes.

Conclusion : Results in the current study demonstrated a modulating effect of NO on empathy induced short and long-term changes in nociception. Further studies addressing the specific brain regions and other neurotransmitters involved are recommended.

Keywords : empathy, hyperalgesia, short and long-term changes

Count: 438
Abstract ID: 642
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

The effect of hydroalcoholic extract of Moringa oleifera plant on anxiety and depression of migrane-like male rats

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Background and Aim : Migraine is a common and chronic neurological disorder that is accompanied by moderate to severe one-sided headache attacks accompanied by nausea, vomiting, photophobia, and phonophobia. Today, there are no suitable treatments for migraine, but the use of 5-HT1F receptor antagonists is suitable for treatment. Moringa oleifera is safe to use and its toxicity is very low. Since migraine causes expansion of cerebral vessels and also stimulates the release of chemical mediators in the brain. Therefore, this plant can improve this disease by having anti-inflammatory properties, so the aim of this study is to investigate the effect of the hydroalcoholic extract of this plant on the changes in symptoms of anxiety and depression caused by migraine

Methods : Experiments were performed on 32 male rats with a weight range of 180-200 in 4 groups (control - migraine - extract 50 - extract 100). First, migraine was induced in animals by injecting the drug nitroglycerin. Then Moringa oleifera plant extract was injected intraperitoneally in two doses of 50 and 100 mg/kg for 14 consecutive days. On the 25th day, the Elaveted plus maze test was performed to measure the level of anxiety and the Morris water navigation task test was performed to assess depression. At the end of the euthanized animals and after perfusion with cold saline solution, the prefrontal cortex of the brain was quickly extracted and the level of brain serotonin was measured

Results : The results of the study showed that doses of 50 and 100 led to a reduction in anxiety and depressive-like behaviors. In the following, doses of 100 and 50 alcoholic extracts of Moringa oleifera led to an increase in serotonin levels in migraine animals. By examining behavioral tests, the increase in serotonin levels can be directly related to these behaviors

Conclusion : The results of the present study showed that the hydroalcoholic extract of Moringa oleifera can affect depression and anxiety-like behaviors caused by the induction of migraine headache and have a positive effect on the mood adjustment of migraine animals

Keywords : migrane_serotonin_dopamine_anxiety_depression

Count: 439
Abstract ID: 562
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Exploring the Synergistic Effect of Fennel and Chamomile Extracts on Acute Pain

Submission Author: Sama Barati

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Background and Aim : Acute pain is a common and distressing experience that affects various populations. Conventional pain medications have limitations and side effects, leading to interest in alternative approaches. Fennel (Foeniculum vulgare) and chamomile (Matricaria chamomilla) have potential analgesic properties due to their bioactive compounds. This study aims to investigate the combined effect of these extracts on acute pain and determine if they can enhance pain relief beyond their individual effects. Understanding this synergistic effect could help develop more effective pain management strategies.

Methods : In this study, we use male Sprague-Dawley rats weighing between 150-200 grams. The rats were divided into 8 groups, with 7 rats in each group. Previous relevant studies have suggested a group size ranging from 6 to 10 rats per group. The groups were categorized as follows: 3 experimental groups received chamomile injections at doses of 357, 714, and 1071 mg/kg, 3 experimental groups received fennel injections at doses of 42, 84, and 126 mg/kg and 1 experimental group received a combination of chamomile and fennel extracts at the most effective doses (357 and 84) determined from the previous experimental groups. There was also a control group that received saline injections. All 8 groups were housed together in the same environment

with access to food and water for one week. After this period, the pain tolerance of each group was measured using the Hot Plate apparatus.

Results : The results of our study indicate that the combination of fennel and chamomile extracts at specific doses (84mg/kg of fennel and 357mg/kg of chamomile) had a significant effect on pain tolerance in rats. This suggests a synergistic interaction between the two extracts, where their combined action produces a greater analgesic effect than what each extract can achieve individually.

Conclusion : In conclusion, our study provides evidence for a synergistic effect of fennel and chamomile extracts on acute pain in rats. These findings highlight the potential of combining herbal extracts as a novel approach to enhance pain management. Future research should focus on elucidating the underlying mechanisms of this synergistic effect and conducting clinical trials to validate these findings in human subjects.

Keywords : Fennel; Chamomile; Pain; Hotplate; Herbal medicine

Count: 440
Abstract ID: 660
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Types of neuropathy and factors involved in diabetic neuropathy

Submission Author: Hamid Reza Ghaffari

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Background and Aim : Diabetic neuropathy is one of the common complications of diabetes that affects the sensory, motor and autonomic nervous system and is the main cause of non-traumatic amputation in diabetic patients. The four main patterns of peripheral neuropathy are: polyneuropathy, mononeuropathy, multiplex mononeuritis, and autonomic neuropathy.

Methods : In this review study, the key words neuropathy and Diabetic neuropathy were searched in Pub Med, Science Direct, Google Scholar, SID, and Magiran databases in order to find available studies on the topic under investigation. A total of 214 articles were found and all articles were reviewed.

Results : -Hyperglycemic condition is known to activate both oxidative stress and inflammatory pathways. There is much scientific evidence supporting the involvement of inflammatory pathways in direct peripheral nerve damage and neuroinflammation. Platelets play a role in the pathogenesis of vascular disease associated with diabetes. Markers of platelet activation such as beta-thromboglobulin and platelet factor 4 are higher in people with type 2 diabetes than in non-diabetic people. Linoleic acid levels are normal in human and experimental diabetes. However, gamma-linolenic acid is reduced as a result of delta-6-unsaturated enzyme deficiency. This deficiency appears to be responsible for many of the microvascular changes in diabetic neuropathy. There is also evidence supporting the role of vascular inflammation in the pathogenesis of diabetic neuropathy. Accumulation of all these evidence suggests that neuroinflammation is not the sole episode underlying peripheral nerve damage but it is accompanied by inflammation and oxidative, nitrosative stress in the vasa nervorum and neuroglial cells.The damaged nerve terminals are the reason for tingling and loss of sensation and reflexes are often first observed in the feet and then they ascend to affect other areas . One of the major causes for all these complications is reactive

oxygen species (ROS) produced from processes initiated and amplified under chronic hyperglycemic conditions.

Conclusion : Diabetic neuropathy is a syndrome which can affect both the somatic and autonomic divisions of the peripheral nervous system. Pathophysiology of diabetic neuropathy involves a complex cascade mechanism consists of several interrelated components, it is still not precisely known.

Keywords : neuropathy,polyneuropathy, mononeuropathy, multiplex mononeuritis, autonomic neuropathy.

Count: 441
Abstract ID: 273
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Blockade of the orexin receptor type 1 of the basolateral amygdala induces hyperalgesia in dominant male rats

Submission Author: Sharareh Khavandkari

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Background and Aim : Social hierarchy is one of the most influential social structures. The stress response is critically associated with the gender and social position of a person. Chronic stress and anxiety are occasionally in the person life which is dependent to its social hierarchy status. Chronic stress, anxiety and social hierarchy also affect the pain perception. Similarly, pain results from the integration of sensory information with cognitive and emotional processes. Human imaging studies have shown the role of the prefrontal cortex and amygdala network in the integrating the cognitive functions with pain information. The medial prefrontal cortex projections to the basolateral amygdala (BLA) are involved in the integration and preserving the nociceptive and social status information. The BLA receives orexinergic projections from the lateral hypothalamus. Orexin plays a crucial role in the social failure stress-induced behavioral vulnerability. Also, the orexinergic system is involved in the control of the stress, anxiety, social hierarchy, and pain modulation through the orexin receptor type 1 (Orx1 receptor) activation. Therefore, the present study was designed to investigate the role of the Orx1 receptors of the BLA in modulating acute thermal pain in adult male rats with different social hierarchies.

Methods : In this study, male Wistar rats (weighting 200-270 grams) were purchased from the animal facility of Tabriz University of Medical Sciences. Sixty rats divided into three groups: dominant/control (intact animals who are dominant in the social hierarchy), dominant/DMSO (DMSO injection into the BLA of the dominant animals), and dominant/SB (SB injection into the BLA of the dominant animals) groups. Primarily, the tube test was used to induce social hierarchy. Next, bilateral cannulation of the BLA was stereotaxically performed for drug injections. After

recovery period, DMSO and SB334867 (the Orx1 receptor antagonist) were injected into the BLA nuclei, and 5 minutes later, the tail flick and hot plate tests were accomplished by 60 seconds intervals. Every test was recorded for 70 minutes with 10 minutes intervals. Finally, animals were anesthetized and their brains were removed and checked for the precise cannula implantation in the BLA nucleus. The latency time to response and maximal possible effect (MPE%) were utilized to analyze the tail flick and hot plate tests data, respectively. Data were analyzed using repeated measures of Two-Way ANOVA by Prism software.

Results : The results of the current study showed that bilateral intra-BLA injection of a 50 nM dose of orexin receptor type 1 antagonist (SB334867) significantly decreased the latency time to tail flick response in 30 ($P<0.05$), 50 ($P<0.01$), 60 ($P<0.01$), and 70 ($P<0.01$) minutes in dominant rats. Furthermore, intra-BLA injection of 50 nM SB334867 meaningfully increased the MPE% of hot plate response in 10 ($P<0.01$), 20 ($P<0.05$), 40 ($P<0.001$), 50 ($P<0.05$), 60 ($P<0.05$), and 70 ($P<0.01$) minutes in dominant rats.

Conclusion : It seems that the blockade of the orexin receptor type 1 of the BLA induces hyperalgesia in dominant rats. Therefore, it can be concluded that the BLA orexinergic system are probably involved in the pain modulation in the dominant status of the social hierarchy.

Keywords : Social hierarchy; Basolateral Amygdala; Pain; Orexin 1 receptor

Count: 442
Abstract ID: 78
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

The study of anti-inflammatory and analgesic of hydroalcoholic extract of Helichrysum leucocephalum in exprimental animals

Submission Author: Mohadeseh Mohebbi

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Background and Aim : Many therapeutic properties have been reported for different species of Helichrysum leucocephalum from the past until now, but there have not been many studies on the anti-inflammatory and analgesic effects of Helichrysum. Therefore, this study was designed for the first time with the aim of investigating the anti-inflammatory and analgesic effects of the hydroalcoholic extract of Helichrysum leucocephalum capitols

Methods : : In this experimental study, 60 rats and 60 male mice were grouped into different groups, and the anti-inflammatory and analgesic effects of the extracts were measured in three doses of 200, 100, and 50 mg/kg, respectively, by using hot plate, writing, carrageenan and cotton pellet tests. Morphine (5 mg/kg) by intraperitoneal injection , mefenamic acid (30 mg/kg) or indomethacin (5 mg/kg) were used as standard treatment in the tested under study. Then, all the results were statistically analyzed with Graphpad prism 8.0.2 (P-Value>0.05) as a significant criterion

Results : According to the findings of the hot plate tests, the extract of the immortelle plant in intraperitoneal administration was able to significantly increase the reaction time to the thermal pain stimulus in comparison with the control group. In the writing test, the extract of Helichrysum leucocephalum in doses of 100 and 200 mg/kg was able to significantly reduce the average number of contractions compared to the control group (P-Value <0.05). The results of carrageenan test show that there is no significant difference between the extract group in the doses studied and the

control group in the 30th minute of the study (P-Value<0.05). No significant difference was found between the extract group and the control group in the first hour after the induction of inflammation, but a significant difference was observed between the mefenamic acid group and the extract group. The doses of 200 and 300 mg/kg showed significant analgesic effects compared to the control group in the second and third hour after induction of inflammation, although the anti-inflammatory effect of mefenamic acid 30 mg/kg was higher than all groups. In the fourth hour of investigation, all doses of the studied extract showed a significant anti-inflammatory effect compared to the control group (P-Value <0.05). However, this effectiveness was significantly lower than standard treatment. None of the doses of the examined extract could have a significant effect in comparison with the control group in the cotton pellet test, at the same time, the effectiveness of indomethacin was also reported to be significantly higher (P-Value <0.05).

Conclusion : The results show that this herbal extract can be used as a complementary treatment in the control of visceral pain and acute inflammation. However, it is strongly recommended to plan and implement more studies in this regard, considering the novelty of the subject under study.

Keywords : anti-inflammatory, analgesic, Helichrysum leucocephalum

Count: 443
Abstract ID: 466
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

[Met5]enkephalin semicarbazide, with higher analgesic effects, compared with [Met5]enkephalin

Submission Author: Zahra Rezaeiasl

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Background and Aim : Dipeptidyl carboxypeptidase-I is an enzyme involved in the biological degradation of enkephalins.It has been suggested that C-terminal amidation of enkephalins enhances their resistance to dipeptidyl carboxypeptidase-I-mediated biodegradation.

Methods : In this study, a novel [Met5]enkephalin amide (MEA) analogue [Met5]enkephalin (ME)-semicarbazide synthesized by another laboratory in our group was assessed for its antinociceptive effects compared with ME-ethylamide, MEA and ME, using tail flick test. To protect the administered drugs from biodegradation, rats were pretreated with peptidase inhibitors including amastatin, phosphoramidon and captopril. Then captopril (dipeptidyl carboxypeptidase-I inhibitor) was deleted from the peptidase inhibitors' combination for evaluating in vivo resistance of the synthetic drugs to dipeptidyl carboxypeptidase-I.

Results : According to the results, ME-semicarbazide and MEA were resistant enough to dipeptidyl carboxypeptidase-I to exert their strong antinociception following intrathecal administration even in the absence of captopril, whereas the antinociceptive effects produced by ME-ethylamide (10 nmol) were abolished in rats not pretreated with captopril, indicating that significant amounts of the ME-ethylamide were degraded by dipeptidyl carboxypeptidase-I.

Conclusion : Replacement of the amide moiety of MEA with semicarbazide provides a new ME derivative, with high analgesic effects as well as more resistance to dipeptidyl carboxypeptidase-I-mediated biodegradation.

Keywords : enkephalin amide; tail-flick latency ; semicarbazide; antinociception; dipeptidyl carboxypeptidase-I

Count: 444
Abstract ID: 497
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Blocking the dopaminergic receptors within the hippocampal dentate gyrus reduced analgesic responses induced by restraint stress in the formalin test

Submission Author: Farzaneh Nazariserenjeh

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Background and Aim : There is much evidence that hippocampal dentate gyrus (DG) neurons have acquired an important role in processing and modulating pain-related information. Also, it has been shown that dopamine receptors play an essential role in the modulation of pain perception. Stressful experiences can produce analgesia, termed stress-induced analgesia (SIA). In the current study, we examined the probable role of D1 dopamine receptors within the DG in antinociception induced by restraint stress (RS).

Methods : Adult male Wistar albino rats were implanted with guide cannulae in the DG region. Animals received intra-DG microinjections of SCH23390 (0.25, 1, and 4 µg/rat) as D1-like dopamine receptor antagonist, five minutes before RS. Ten minutes after the end of the induction of RS for three hours, 50 µL 2.5% formalin was injected subcutaneously into the plantar surface of the hind paw to induce persistent inflammatory pain. Pain scores were evaluated at 5-minute intervals for 60 minutes.

Results : These findings showed that; exposure to RS for three hours produced SIA in both phases of the formalin test. Moreover, antinociceptive response produced by RS during the formalin test was attenuated in the early and late phase of the formalin test by intra-DG microinjection of SCH23390. On the other hand, the data showed that locomotion in 5-minute blocks during one hour was not changed by intra-DG cannulation and injection of SCH23390 or vehicle.

Conclusion : The results of the present study suggested that D1-like dopamine receptors in the DG has a considerable role in analgesia induced by RS.

Keywords : Dentate gyrus; Dopamine receptors; Restraint stress; Analgesia

Count: 445
Abstract ID: 498
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Contribution of the intra-hippocampal orexin-1 receptors in the regulation of restraint stress response to pain-related behaviors in the formalin test

Submission Author: Farzaneh Nazariserenjeh

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Background and Aim : Stress-induced antinociception (SIA) is due to the activation of several neural pathways and neurotransmitters that often suppress pain perception. Studies have shown that the orexin neuropeptide system is essential in pain modulation. Therefore, this study aimed to investigate the role of orexinergic-1 receptors (OX1r) in the hippocampal CA1 region in modulating SIA response.

Methods : In this study, adult male Wistar albino rats anesthetized and two guide cannulae were bilaterally secured 1 mm above the CA1 region of hippocampus. After vehicle or OX1r antagonist, SB334867 injection, rats were subjected to restraint stress for 3 hours and then 5 min later, formalin was injected into the plantar surface of the right hind paw. The pain behaviors observe and check in the formalin test as an animal model of inflammatory pain. GraphPad Prism 6.0 (GraphPad Software,CA, USA) commercial software was used for statistical analysis

Results : The results were expressed as mean ± SEM (SEM). Locomotor activities were measured in the open field. The obtained results showed that formalin injection increases pain behavior in the early and the late phases and RS significantly reduces the pain scores in both the early and late phases compared to those in the control group ($P < 0.0001$). Intra-CA1 injection of OX1r antagonist, SB334867 reduced the antinociceptive effects after exposure to stress in both phases of the formalin test. Moreover, the results also indicated that the immobility stress and intra-CA1 injection of SB334867 had no significant effect on the movement activity of the animals

Conclusion : Accordingly, the OX1r in the CA1 region play a critical role in the regulation of SIA response to pain behaviors in the formalin test

Keywords : Orexin receptors; Restraint stress; Hippocampus; Pain; Formalin test

Count: 446
Abstract ID: 592
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

Study of the effect of Itaconic acid on thermal and chemical pain induced in larva and thermal pain in adult Drosophila melanogaster

Submission Author: Javad Jahangiri

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Background and Aim : Itaconate is a metabolite synthesized from cis-aconitate in the tricarboxylic acid (TCA) cycle. It is produced in large quantities in activated murine macro-phages. The reason for this induction is that itaconate can be considered as an immunomodulator with potent anti-inflammatory and antimicrobial effects. The upcoming experiments show that the presence of this substance in the Drosophila melanogaster culture environment can also be an obstacle to the pain induced by chemical agents or heat in the animal.

Methods : Two tests are used to diagnose pain induction in adult Drosophila and larvae. Adult Drosophilae that were treated for four days in culture medium containing itaconic acid with three different concentrations (0.1, 0.01, 0.001 mg/ml) were used in the test. Thermal pain test was performed by placing the adult animal on the hot plate while their wings were glued together and the escape latency was recorded. The larvae that were placed in the culture medium containing itaconic acid for 4 days participated in the chemical pain test induced with different acetic acid concentration groups (zero to 50% with 10% intervals) and the degree of their twist was checked. In another test using a hot plate, thermal pain and the amount of twist caused by heat were checked on several temperatures groups (35-47 ℃) and the results obtained were compared with the results of similar tests in the control group. All Drosophilae were randomly tested in groups of seven.

Results : During the thermal test, the maximum endurance was observed in adult flies at a concentration of 0.1, 0.01 and itaconic acid, which is significantly increased compared to the control group ($p<0.05$). In the chemical test for larvae, increasing the concentration of acetic acid causes a significant increase in twisting movements in the control group, but in contrast, a significant decrease in the amount of twisting was seen at the group that was exposed to 0.1mg/ml itaconic acid ($p<0.001$). However, no significant effect was observed in the concentration of 0.001

itaconic acid ($p>0.05$). Increasing the concentration of itaconic acid significantly reduced twisting movements in Drosophila larvae against thermal pain. The greatest effects were seen in the concentrations of 0.01 and 0.1mg/ml, which has reduced twisting during the temperature increasing up to 45℃ ($p<0.001$).

Conclusion : The use of itaconic acid as an anti-inflammatory drug in adult and larval Drosophila is able to increase the response time to thermal and resistance to chemical stimuli and may be it could be consider as an analgesic factor specially for inflammatory pain which needs more animal mechanistic investigations.

Keywords : Thermal pain , Chemical pain, Drosophila melanogaster, Itaconic acid

Count: 447
Abstract ID: 548
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Effect of acute bupropion injection a dopamine and noradrenaline reuptake inhibitor on neuropathic pain in a rat model of chronic constriction injury (CCI)

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Background and Aim : Analgesics are widely used in neuropathic pain (NP), but some antidepressants have also shown analgesia. This study was designed to determine whether acute bupropion administration was effective in alleviating symptoms of neuropathic pain in a rat model of neuropathic pain. Neuropathic pain was induced by chronic constriction injury (CCI) of the sciatic nerve in the rats that resulted in stimulus-evoked thermal hyperalgesia, mechanical and cold allodynia.

Methods : We administrated bupropion (3, 10, and 30 mg/kg IP) on 7th, 14th, and 21st days post-surgery to examine the effect of bupropion on the development of NP. We also performed behavioral tests on the 7th, 14th, and 21st days post-CCI.

Results : Acute bupropion injections (3, 10, and 30 mg/kg i.p.) on the 7th, 14th, and 21st postoperative days could not reduce thermal hyperalgesia and mechanical and thermal allodynia significantly compared to the CCI group.

Conclusion : These results indicate that acute treatment with bupropion on the 7th, 14th, and 21st days after surgery, exhibited tactile, cold and thermal hypersensitivity similar to that of vehicle-treated rats for the study.

Keywords : Neuropathic Pain, Bupropion,Chronic constriction injury

Count: 448
Abstract ID: 354
subject: Motor Systems and Movement Disorders: Posture and Gait
Presentation Type: Poster

Effects of 10-week Exercise Therapy in Transverse Plane at Home on Postural Stability and Initiation of Gait in Patients with Parkinson's Disease: A Clinical Trial

Submission Author: Mohammed Ashtiani

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Background and Aim : Parkinson's disease (PD) is one of the common neurological disorders, which occurs due to a lack of dopamine secretion in the substantia nigra. Bradykinesia, tremors, postural instability, and freezing of gait are the main locomotive hallmarks of PD. This disease is a chronic and progressive movement disorder, known as the second most common degenerative neurological disease in the world, and its prevalence rate in Iran is 261 per 100,000 people. Some studies have investigated the effects of therapeutic exercises targeting balance, strengthening, etc., on patients' postural symptoms, most of which were focused on lower limbs. Biomechanical analyses have pointed out the difference between patients and healthy people in rotating trunk activities and increasing the risk of falling. No study has investigated the effect of trunk exercises in the transverse plane on posture control reflected in parameters like the center of pressure or the first step at the gait initiation. The present study aims to investigate the effect of ten weeks of home exercises in the transverse plane on the posture and initiation of gait patients with PD.

Methods : Sixteen patients with PD participated in this randomized clinical trial in two control groups (7 people) and intervention (9 people). During ten weeks, the control group received common stretching exercises while the intervention group received these exercises in addition to trunk rotational exercises in the transverse plane at home whose therapy had been monitored via video communications. The pre- and post-intervention evaluations consisted of a quiet standing

test and the first step at the initiation of gait on a forces platform. In addition, PDQ-39 quality of life questionnaire was also collected from the volunteers.

Results : Quality of life was not improved in the intervention group (p=.686). The center of pressure (CoP) sway area was reduced after the trunk exercises (p=.046). CoP anterior-posterior variability was significantly reduced after the rotational trunk exercises (-2 mm, p=.028). Mediolateral path length and variability were unchanged after the exercises and between the groups. Variability (-3.6 N, p=.028) and range (-4.4 N, p=.028) of the vertical ground reaction force in standing were significantly reduced after the trunk exercises. CoP displacements during gait initiation were expanded after interventions (+4 mm, p=.028). CoP unloading displacement and loading velocity were significantly different between control and intervention groups (p=.016).

Conclusion : Ten weeks of home exercises in the transverse plane can improve standing stability in patients with PD. These exercises can make the first step faster and larger, which was slow and short mainly due to the freezing of gait. These exercises could not improve the quality of life of the patients with PD.

Keywords : Parkinson’s disease; postural control; gait initiation; trunk exercise

Count: 449
Abstract ID: 355
subject: Motor Systems and Movement Disorders: Posture and Gait
Presentation Type: Poster

Biomechanical Evaluation of Trunk Stability in Response to Unexpected Quick Release Perturbation in Patients with Parkinson's Disease and Age-matched Healthy Individuals

Submission Author: Mohammed Ashtiani

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Background and Aim : Parkinson's disease (PD) is a progressive neurological disorder, which is associated with a decrease in the level of dopamine secretion in a part of the midbrain. Patients with PD suffer from symptoms such as slowness of movements, limb tremors, muscle stiffness and trunk instability. Providing postural stability is crucial in patients with PD, and according to previous studies, an important part of it is fulfilled by the trunk. The aim of this study was to evaluate trunk stability in response to quick release perturbation in patients with PD compared to healthy age-matched individuals.

Methods : Ten patients with PD and 10 healthy individuals in the control group who were matched in terms of demographic data were included in this observational cross-sectional study. An unstable seat was designed and manufactured so that participants would experience the perturbation of a quick release by sitting on it. The motion analysis method was used by attaching six markers on the seat and the trunk of the participants to calculate the kinematic data of the instability of the trunk. In addition, by measuring the excursion of the center of pressure by a forceplate under the entire set of the seat and participants, the amount of trunk flexor/extensor torque was calculated.

Results : results of this study showed that the kinematic and torque variables in the first trial to provide stability after quick release were not significantly different between patients and healthy

people ($p > 0.05$). However, in the third trial, healthy people reached higher stability than patients with PD by getting familiarized with quick release. The variability of patients' seat sway in the third trial was 5 degrees in the flexion direction ($p = 0.019$) and 1 degree in the lateral direction ($p = 0.047$) significantly more than healthy subjects. In addition, comparing the results concerning the sway directions, it was found that the most sway in patients was in the direction of flexion, axial rotation, and then lateral, respectively.

Conclusion : Patients with PD have less ability to maintain trunk stability. This defect is more in flexion and axial rotation directions. Therapeutic exercises to improve posture control can be based on coordinating exercises of the core region muscles by focusing on flexion and axial rotation.

Keywords : Parkinson’s disease; trunk instability; quick release perturbation; motion analysis

Count: 450
Abstract ID: 342
subject: Motor Systems and Movement Disorders: Motor Neurons and Muscle
Presentation Type: Poster

Comparison the effect of trunk and lower limb neuromuscular control among active individuals with chronic ankle instability, copers and healthy controls during, footwork dynamic discrete tasks: A syste

Submission Author: Somayeh Mohamadi

Somayeh Mohamadi[1], Nahid Rahmani[2]

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Background and Aim : -Background Chronic ankle instability (CAI) is one of the most prevalent lower limb injuries. The purpose of the present study was to systematically review all related studies that investigated the kinetic chain neuromuscular control in CAI individuals compare with copers and healthy subjects during dynamic discrete tasks.

Methods : - Methods Available databases like PubMed, Scopus, Science Direct, Medline and Web of science were searched using following keywords: neuromuscular control, dynamic balance, postural control, chronic ankle instability, ankle sprain, functional instability, star excursion balance test, counter movement jump, hopping, cutting, drop landing, jump landing, stepping, kinematic, kinetic, electromyography (EMG), muscle activity, coper and healthy from the beginning until the October 2023. Ten relevant articles met the inclusion criteria.

Results : -Results Of 10 studies, the SEBT task was investigated in three studies, jump-landing task was assessed in four studies, jump landing and side cutting was assessed in two studies and Biodex balance task in one study. For outcome variables, the seven studies evaluated muscle activity using EMG and dynamometer, in six studies the kinematics were assessed and five studies reported kinetic parameters. Balance scores was evaluated in four studies and three articles studied the reach distance. Five articles investigated on the hip, knee and ankle, two the hip and ankle but one study examined trunk, hip, knee and ankle, one trunk, hip and ankle and one knee and ankle. Most of the studies considered in the present review, reported decreased muscle activity, lower postural control and balance indices and lower kinematic and kinetic parameters, in patients with CAI. In the most of the parameters, copers and healthy subjects were considered similar.

Conclusion : Significance: The findings revealed that patients with CAI demonstrated more neuromuscular deficits during dynamic discrete tasks than the other groups. Identified neuro-musculoskeletal deficits provide opportunities for better intervention and prevention strategy after ankle sprain.

Keywords : chronic ankle instability, postural control, jump, landing, star excursion balance test, coper

Count: 451
Abstract ID: 581
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Investigation the effects of Caffeic Acid Phenethyl Ester simultaneous with Levodopa and Benserazide on Parkinson's Models in Rats

Submission Author: Parnia Tarahomi

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Background and Aim : Parkinson's disease (PD) is the second most common neurodegenerative disease after Alzheimer's disease. PD impairs or kills the dopaminergic neurons of the corpus luteum and leads to motor symptoms such as tremors at rest, muscle stiffness, slowness of movement, and imbalanced walking. The psychological symptoms include anxiety, depression, and aggression. The leading cause of the disease is unknown, and no definitive cure has been found so far. Previous studies have shown that the use of Caffeic Acid Phenethyl Ester (CAPE) could improve the condition of PD patients. This study aimed to evaluate three different doses of CAPE, alongside levodopa and benserazide administration, on behavioral symptoms and histopathology of an animal PD model.

Methods : In this experimental study, 49 adult male Wistar rats were randomly divided into seven groups. To induce PD, neurotoxin 6-OHDA was injected into Substantia Nigra compacta (SNc) of the brain's left hemisphere using a stereotaxic device. One week after the neurotoxin injection, the Elevated Body Swing Test (EBST) was performed to confirm the PD model. The treated PD groups received three doses of µmol/kg, 20 mol/kg 20, and 40 µmol / kg of the antioxidant CAPE in addition to levodopa and benserazide for two weeks. EBST testing was performed in four steps;

before Parkinsonism, one week after Parkinsonism, and one week and two weeks after starting treatment. Elevated plus-maze test (EPM) and Open field test were performed at the end of treatment to monitor movement and quasi-anxiety behaviors of the animals. Histological sections and staining were obtained from SNc of animal brains and dopaminergic neurons were counted. Data were analyzed using SPSS software, and the significance level considered was $P < 0.05$.

Results : The findings showed that different doses of CAPE antioxidant significantly improved motor and quasi-anxiety behaviors of PD models compared to the control group. All three doses significantly increased the total number of neurons in SNc in groups. The treatment was compared to the PD control group. The number of dopaminergic neurons in SNc increased in all treatment groups but was not significantly different from the control group. It is noteworthy that at 40 mol/kg dose of CAPE, $p < 0.2$ was the assumption, and the difference could be significant if the sample size was larger.

Conclusion : CAPE antioxidant alongside levodopa and benserazide can be used to improve motor and behavioral complications of Parkinson's disease and reduce the side effects of levodopa. Due to the different histopathological changes caused by different doses of antioxidants, molecular studies could be fruitful in future studies

Keywords : CAPE, SNc, Parkinson's disease, Levodopa, EBST, EPM, Open field.

Count: 452
Abstract ID: 187
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Imipramine reduces movement disorders in a rat model of Parkinson's disease

Submission Author: Mahdi HajiBabaei

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Background and Aim : Parkinson's disease is a progressive disorder that is caused by degeneration of nerve cells in the part of the brain called the substantia nigra, which controls movement. These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine. The cause of Parkinson's essentially remains unknown. However, theories involving oxidative damage, environmental toxins, genetic factors and accelerated aging have been discussed as potential causes for the disease. Imipramine, a tricyclic antidepressant, has been reported to have anti-inflammatory and antioxidant effects in the central nervous system. The aim of this study was to investigate the protective effect of imipramine on movement disorders in a rat model of Parkinson's disease.

Methods : Adult male Wistar rats, weighing 220-25 g, were used in this study. The rats were divided into 5 groups as follows: Control, Sham, 6-OHDA, 6-OHDA + Imipramine (20 mg/kg), and Imipramine (20 mg/kg). To create Parkinson's disease model, 6-OHDA (4 µg/µl; 5 µl) was injected unilaterally into the medial forebrain bundle (MFB) area of right hemisphere using a Hamilton microsyringe. After ensuring induction of Parkinson's disease model, treatment with imipramine (20 mg/kg) was performed intraperitoneally for 14 days (72 h after 6-OHDA injection). The beam and rotarod tests were used to assess movement disorders.

Results : The results showed that 6-OHDA injection into the MFB led to movement disorders in the beam and rotarod tests. while, intraperitoneal administration of imipramine (20 mg/kg) reduced movement disorders in the Parkinson's rats induced by 6-OHDA.

Conclusion : Imipramine can be considered as a significant therapeutic strategy in reducing movement impairment in Parkinson's patients.

Keywords : Imipramine ;Parkinson's disease ; Movement disorders ; Rats

Count: 453
Abstract ID: 241
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Effect of Hydroxychloroquine on Locomotor disturbances and Oxidative Stress Status in Parkinson's disease in Adult Male Rat

Submission Author: SeyedZanyar Athari

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Background and Aim : Parkinson's disease (PD) is a neurodegenerative disorder involving the gradual loss of dopaminergic neurons in the midbrain. Clinically, symptoms of PD can be categorized as non-motor signs and motor symptoms. Motor symptoms consist of bradykinesia, tremor at rest, rigid muscles, impaired posture, and imbalance. Genetic factors, inflammation, oxidative stress, mitochondrial dysfunction, and cytotoxic factors play a role in PD's pathophysiology. The injection of 6-hydroxydopamine (6-OHDA), a hydroxylated analog of dopamine, into the substantia nigra pars compacta (SNpc) or striatum leads to PD-like biochemical and motor dysfunctions. This toxin is easily absorbed by dopaminergic neurons and induces neurotoxicity by inhibiting the mitochondrial electron transport chain and provoking oxidative stress. There is currently no reported solution to prevent progressive neuronal death in PD, despite treatments for motor symptoms. The later stages of PD pose a challenge in managing moderate to severe cases as the response to levodopa progressively declines and levodopa-resistant symptoms appear. Hydroxychloroquine (HCQ), a derivative of chloroquine, has the ability to cross the blood-brain barrier and provide anti-inflammatory and neuroprotective benefits. In an animal model of PD induced by rotenone, HCQ alleviated motor deficits by suppressing striatal inflammatory cytokines and restoring tyrosine hydroxylase (TH) positive neurons levels. This study explored the impact of HCQ administration on motor function, oxidative stress markers, and histopathological changes in a rat model of PD induced by 6-OHDA.

Methods : A total of forty-eight adult male Wistar rats, weighing 250±20 g, were included in this study. Animals were randomly divided into four groups as follows: sham group (unilateral intra-SNpc injection of the vehicle of 6-OHDA and treatment with normal saline (2 ml/kg, p.o.) for 21 days), PD (unilateral intra-SNpc injection of 6-OHDA and treatment with normal saline (2 ml/kg, p.o.) for 21 days), PD+levodopa (unilateral intra-SNpc injection of 6-OHDA and administration of levodopa (12 mg/kg, p.o.) twice daily for 21 days), and PD+HCQ (unilateral intra-SNpc injection of 6-OHDA and intragastric administration of HCQ (100 mg/kg) for 21 days). Apomorphine-induced rotational behavior and the Bar test were used to assess the motor function after treatment. After euthanasia, brain samples were collected and the levels of lipid peroxidation index (MDA), glutathione peroxidase activity (GPx), total antioxidant capacity (TAC), and α-synuclein protein expression were measured in the SN.

Results : The behavioral tests revealed that HCQ, similar to levodopa, decreased muscle rigidity and rotational behaviors triggered by 6-OHDA. Additionally, the induction of PD resulted in higher levels of ?-synuclein protein and MDA, as well as lower levels of TAC and GPx activity. However, HCQ caused a decrease in ?-synuclein and MDA levels, but an increase in TAC levels and GPx activity. Moreover, histopathological data revealed that HCQ provides protection to dopaminergic neurons against 6-OHDA-induced toxicity.

Conclusion : HCQ treatment improved motor impairment and reduced neuronal loss in the SN, possibly by boosting GPx activity and lowering α-synuclein protein levels. Further research is required to determine the specific neuroprotective mechanism of HCQ in PD models.

Keywords : Parkinson’s disease; hydroxychloroquine; levodopa; 6-OHDA; oxidative stress

Count: 454
Abstract ID: 672
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Second Order Sliding Mode Controller for Parkinson's Tremor Rehabilitation

Submission Author: Reyhaneh Valibeik

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Background and Aim : Parkinson's disease (PD) is a common neurological condition. The signs of the condition include tremor, bradykinesia, postural instability, flexed posture, and stiffness. The inability or demise of dopamine producing cells in the substantia nigra (SN) of the brain is the root cause of Parkinson's disease. Dopamine, a neurotransmitter, regulates basal ganglia (BG) activity. Without dopamine, bodily motions are erratic. A hypokinetic condition, like PD, results when the indirect pathway circumvents the direct pathway and causes further inhibition in the thalamus. According to some studies, an uneven transmission signal in both the direct and indirect channels can cause a tremor with a frequency of 4-6 Hz and a high amplitude. Recently, deep brain stimulation (DBS), a common neurological surgery, has been shown to treat numerous PD movement abnormalities. This is one of the greatest ways to control hand tremors in advanced PDs. Prior to this, the DBS approach was employed without feedback in an open-loop setting. As a result of the persistent and extensive side effects of direct bias stimulation (DBS), including muscle contraction and speech disorders, the closed-loop (feedback) approach is more effective in mitigating DBS intensity and side effects. Considering the accessibility and ease of measuring seismic data, a number of research investigations have employed the closed-loop technique as the feedback signal. A multitude of studies have attempted to mitigate the aforementioned issues through the implementation of model-based closed-loop control strategies. These include the partial state feedback controller, the backstepping controller and the feedback linearization controller all of which are designed to stimulate two regions of BG (STN and GPi) concurrently. Implementing any control mechanism in practice requires ongoing robustness and precision. Sliding Mode Control (SMC) techniques are popular among control scientists. Chattering and

high-frequency oscillatory events limit SMC's use in real-world systems. Second-order sliding mode control methods, show promising results for this class of problems.

Methods : With the purpose of stimulating two distinct regions of the BG model, this work presents two distinct controllers: (i) a partial state feedback (PSF) controller, which is meant to stimulate GPi; and (ii) second order sliding mode controller (SOSMC), which is designed to stimulate STN.

Results : Based on the findings, it is evident that enhancing performance by simultaneously stimulating two regions yields greater outcomes than just one area. It is also shown that SOSMC is a tool that can be utilized to enhance performance.

Conclusion : For the purpose of reducing the tremor that is associated with Parkinson's disease (PD), a BG model is utilized as a test system for the development of the DBS control mechanism. Feedback, especially stimulating the STN and GPi areas at the same time, is suggested as a way to lower tremor, the bad effects of brain stimulation, and the amount of stimulatory energy that is sent to the brain when there is tremor.

Keywords : basal Ganglia; closed-loop deep brain stimulation; Parkinson state

Count: 455
Abstract ID: 148
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

The effect of imipramine on neurotrophic factors in a rat model of Parkinson's disease

Submission Author: Bagher Jafarvand Geiklou

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Background and Aim : Parkinson's disease (PD) is a progressive neurological disease in which dopaminergic neurons progressively deteriorate. The main symptom of the disease is movement impairment, and as it advances, memory and cognitive problems may also arise. Research indicates that the predominant causes of PD include a decrease in dopamine levels, destruction of dopaminergic neurons, the accumulation of lewy bodies, oxidative stress, and inflammation. Neurotrophins, a group of growth factors, not only contribute to the development of the nervous system but also protect neurons in both the central and peripheral systems. Furthermore, they can stimulate the conversion of stem cells into neurons. Imipramine, a type of tricyclic antidepressant, has anti-inflammatory and antioxidant properties within the brain, thus playing a crucial protective role against nerve damage. The aim of this study was to investigate the effect of imipramine on movement disorders and the expression of neurotrophic factors in a model of PD.

Methods : In this study, 40 male Wistar rats with a weight range of 220-250 were used. The rats were divided into 5 groups, each consisting of 8 rats. To create a model of PD, 6-OHDA (4 µg/µl; 5 µl) was injected unilaterally into the medial forebrain bundle (MFB) area of right hemisphere using a Hamilton microsyringe. After ensuring induction of PD model, treatment with imipramine (20 mg/kg) was performed intraperitoneally for 14 days (72 h after 6-OHDA injection). The general activity test was employed to evaluate the rats' motor activity and ensure their overall health. The pole test was used to assess motor disorders, while the apomorphine induced rotation test was carried out to confirm the occurrence of PD and measure the severity of the damage. The

levels of neurotrophic factors (BDNF, GDNF, and NT3) in the rats' striatum were measured using the ELISA technique.

Results : The results indicated that injecting 6-OHDA into the MFB resulted in the occurrence of movement impairments and decreased the level of neurotrophic factors in the striatum of rats. However, intraperitoneal administration of imipramine (20 mg/kg) reduced movement disorders and increased the level of neurotrophic factors in the striatum of PD rats induced by 6-OHDA.

Conclusion : Imipramine can reduce movement disorders caused by 6-OHDA through increasing the level of neurotrophic factors, so it can be considered as an important target for reducing movement disorders in Parkinson's patients.

Keywords : Imipramine; Parkinson's disease; Neurotrophic factors; Rats

Count: 456
Abstract ID: 75
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Neurodegeneration with Brain Iron Accumulation Disorders and Retinal Neurovascular Structure

Submission Author: Elahe Amini

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Background and Aim : The unique neurovascular structure of the retina has provided an opportunity to observe brain pathology in many neurological disorders. However, such studies on Neurodegeneration with Brain Iron Accumulation (NBIA) disorders are lacking.

Methods : This cross-sectional study was conducted on genetically confirmed NBIA patients and an age-gender-matched control group. The thickness of retinal layers, Central Choroidal Thickness (CCT), and capillary plexus densities were measured by Spectral Domain-Optical Coherence Tomography (SD-OCT) and OCT Angiography, respectively. The patients also underwent Funduscopy, ElectroRetinoGraphy (ERG), Visual Evoked Potential (VEP), and neurological examination (Pantothenate-Kinase Associated Neurodegeneration-Disease Rating Scale (PKAN-DRS)). The Generalized Estimating Equation model was used to consider inter-eye correlations.

Results : Seventy-four patients' and 80 controls' eyes were analyzed. Patients had significantly decreased visual acuity, reduced inner or outer sectors of almost all evaluated layers, increased CCT, and decreased vessel densities, with abnormal VEP and ERG in 32.4% and 45.9%, respectively. There were correlations between visual acuity and temporal peripapillary nerve fiber layer (positive) and between PKAN-DRS score and disease duration (negative), and scotopic b-wave amplitudes (positive). When considering only the PKAN eyes, ONL was among the significantly decreased retinal layers, with no differences in retinal vessel densities. Evidence of pachychoroid was only seen in patients with Kufor Rakeb Syndrome.

Conclusion : Observing pathologic structural and functional neurovascular changes in NBIA patients may provide an opportunity to elucidate the underlying mechanisms and differential retinal biomarkers in NBIA subtypes in further investigations.

Keywords : Basal Ganglia; Retinitis Pigmentosa; Retinal Degeneration

Count: 457
Abstract ID: 76
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Olfactory Status in Neurodegeneration with Brain Iron Accumulation Disorders and Huntingtone's Disease

Submission Author: Elahe Amini

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Background and Aim : Olfactory dysfunction has been suggested as a diagnostic and discriminative biomarker in some neurodegenerative disorders. However, there are few studies regarding the olfactory status in rare diseases, including Huntingtone's disease (HD) and Neurodegeneration with Brain Iron Accumulation (NBIA) disorders.

Methods : Genetically-confirmed HD and NBIA patients and their related age-and-gender-matched controls were enrolled. Neurological examinations were conducted according to the Pantothenate Kinase-Associated Neurodegeneration-Disease Rating Scale (PKAN-DRS) for NBIA cases and the Unified Huntington's Disease Rating Scale (UHDRS) for HD patients. Cognition was examined by the Mini Mental State Examination (MMSE) questionnaire. Olfaction was examined by the Sniffin' Sticks test in three subtests: odor threshold (OT), odor discrimination (OD), and odor identification (OI). The total sum olfactory score (TDI), as well as the score of each subtest, were compared to the control group and the most recent normative data set.

Results : NBIA and HD patients had significantly lower olfactory scores compared to the controls in TDI and all three subtests. Around 60% of NBIA patients and 86% of HD cases were hyposmic. TDI score was negatively correlated with UHDRS score in HD. The phospholipase A2-Associated

Neurodegeneration (PLAN) and Mitochondrial membrane Protein-Associated Neurodegeneration (MPAN) patients had a significantly lower OI score compared to the cognitively-matched PKAN patients.

Conclusion : Olfactory impairment, as a common finding in various subtypes of NBIA disorder and HD, can potentially be considered a discriminative biomarker. Better OI in PKAN compared to PLAN and MPAN patients may be related to the different underlying pathologies.

Keywords : Olfaction, Neurodegeneration, Huntingtone's Disease, Iron

Count: 458
Abstract ID: 30
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Laughing ceased, Nitrous oxide-induced Myelopathy evolved: A case report

Submission Author: Mahsa Sepahvand

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Background and Aim : Recreational use of nitrous oxide is increasing among the younger population. There is a great concern about its associated neuropsychological complications. Subacute combined degeneration (SCD) due to functional vitamin B12 deficiency is the most common known neurological disorder due to nitrous oxide abuse. Movement disorder associated with cobalamin deficiency and/or nitrous oxide abuse is a recent issue with limited data in adults.

Methods : we are going to present a 19-year-old previously healthy man presented with progressive gait disturbance, numbness, and tingling in his feet and urinary retention from one week before admission. He needed bilateral aid for standing on his feet. He declared a history of "laughing gas" inhalation in the recent year and each time he had the same tingling sensation in his feet spontaneously improved in 2-3 days. His medical history was otherwise unremarkable.

Results : Nitrous oxide has been used as an inhalant, short-acting anesthetic agent for many years. it can cause euphoria and sometimes hallucinations along with enhancing the effect of other illicit drugs, and is being abused as a recreational drug, called "laughing gas". Chronic inhalation of nitrous oxide, oxidate cobalt ion, the core structure of the cobalamin, which inactivate vitamin B12 and cause functional cobalamin deficiency.(1)

Conclusion : Laughing gas-induced cobalamin deficiency has been reported in the previous decades. The unique point of our case was the combination of SCD and myoclonus. Whether his myoclonus was due to nitrous oxide poisoning and/or cobalamin deficiency is unresolved in our

opinion and needs further investigations in similar cases. It is crucial that clinicians be familiar with this increasingly encountered condition especially in youngsters using nitrous oxide as a recreational substance and be aware of its diverse associated symptoms.

Keywords : Nitrous oxide, Vitamin B12, myoclonus, cobalamin, subacute combined degeneration

Count: 459
Abstract ID: 549
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Association between the Hopkins Falls Grading Scale and Motor Function tests in patients with Multiple Sclerosis

Submission Author: Mostafa Salimi

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Background and Aim : Multiple sclerosis (MS) is a chronic autoimmune and inflammatory neurological disease of the central nervous system. One of the main complications of multiple sclerosis is imbalance and walking problems that can lead to falls. This study investigated the association between a fall measurement scale called the Hopkins Falls Grading Scale (HFGS) and motor function tests in patients with MS.

Methods : This cross-sectional study was conducted using convenience sampling on 85 patients referred to the MS Association of Mashhad, Iran, in 2023. Age above 16 years and below 75 years and not suffering from any other disease that interfered with the ability to walk were the inclusion criteria. Dissatisfaction or disability to perform the test would lead to exclusion from the study. First, a questionnaire was administered that included the following variables: age (years), age of

onset (years), sex, duration of the disease, drugs used by the patient (classified into the following three groups based on the type of drug), and the use of mobility devices such as a walker or cane (has/has not). The HFGS examined falls during the past year and divided them into 4 degrees, and the function test included the timed 25-foot walk test (T25FW) and the timed up and go test (TUG) test. Kruskal–Wallis test and Spearman's correlation coefficient were used for data analysis. The software used in this research is SPSS v.25 and the significance level of the tests is considered less than 5%.

Results : In this study, 68.20% of the patients were women. Most of the patients were in the age group of 35 to 45 years (38.82%). A statistically significant association was obtained between HFGS and functional tests (T25FW and TUG) (for both P-value <0.0001). A significant association was observed between the variables of age (P-value= 0.006), duration of the disease (P-value= 0.03), the use of mobility devices (P-value= 0.05), the use of drugs (P-value=0.04), and HFGS. According to the results of the study, both tests can predict the state of falling in patients with MS.

Conclusion : Considering the association between HFGS and motor function tests in MS patients, clinical experts should pay attention to patients who have slower movement and evaluate them in terms of falling status when performing motor function tests, this evaluation can greatly reduce the rate of falls.

Keywords : Multiple Sclerosis; Hopkins Scale; motor function

Count: 460
Abstract ID: 657
subject: Motor Systems and Movement Disorders: Other
Presentation Type: Oral

Comparative of Histologic and histomorphometric changes of proximal and distal part of the Sciatic nerve in diabetic rat treat by Aloe Vera gel extract

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Background and Aim : Diabetes mellitus, impairs the metabolism of carbohydrates, lipids and proteins, which leads to the dysfunction of the central and peripheral nervous system. Reports suggest that Aloe Vera has anti-diabetic effects. In this study evaluated on comparative of Histologic and histomorphometric changes of proximal and distal part of the Sciatic nerve in diabetic rat treat by Aloe Vera gel extract
Methods : For this study 45 healthy male albino Sprague-Dawley rats weighing 250-200 g were randomly divided in to 3 groups: control (15), diabetic + normal diet (15), and diabetic + Aloe Vera extract (15). the groups as control and diabetic + Aloe Vera receiving 400 mg/kg Aloe Vera extract.After 12 weeks and 16 weeks animals were anesthetized with sodium thiopental (40 mg/kg) via IP injection. After removal of Sciatic nerve on left Sciatic nerve.. Histomorphometric and histologic studies on Sciatic nerve were reviewed and data were recorded.
Results : The diameter of the nerve bundle, in other two groups of diabetic rats was significantly reduced (P <0/05). Diabetic rats showed a significant reduction in mean myelinated fibers (MFs) diameter, axon diameter and myelin sheath thickness in the Sciatic nerve specially distal part of the sciatic nerve.
Conclusion : Based on the findings of this study it can be concluded that diabetes causes changes in distal part of the Sciatic nerve is considerable histologic and histometric In severe diabetic conditions, longer and distal nerve fibres show an earlier loss of nerve mylein compare with proximal part of nerve. The longer treatment of the hydroalcoholic extract of aloe Vera as a potential therapeutic agent can prevent is abnormlity in treat diabetic rat.
Keywords : Diabetes, Aloe Vera, neuropathy,peoximal and distal part of Sciatic nerve, rats

Count: 461
Abstract ID: 609
subject: Integrative system: Neurogenetics
Presentation Type: Poster

Sleep Deprivation, effects on brain development and behavioral functions

Submission Author: Ali Gallaj

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Adequate sleep during developmental stages is crucial for normal brain development, and the relationship between sleep and mental health is bidirectional. Early-life sleep deprivation can have adverse effects on behavior and cognition, as demonstrated by a study on healthy school children, which found correlations between sleep quality and neurobehavioral functioning, particularly in young children. Chronic sleep deprivation can lead to depression, possibly through the serotoninergic system. A study on sleep-deprived rats found that they exhibited depression-like behavior and had elevated levels of inflammatory cytokines plus IL-6, TNF-alpha, and CRP, and hyper-activated hypothalamic-pituitary-adrenal (HPA) axis in sleep-deprived rats, however the exact mechanisms behind these effects are still unclear. Sleep is a complex state of reduced responsiveness to the environment, studied through polysomnography to record brain, eye movement, and muscle activity. Sleep deprivation has significant effects on the molecular biology of the brain, particularly in signaling pathways related to learning, memory, and emotion. Sleep deprivation can disrupt hippocampal glutamate, acetylcholine, and GABA systems, leading to metabolic and cognitive disturbances; sleep deprivation also negatively affects hippocampal long-term potentiation (LTP) and related signaling molecules, potentially due to changes in intracellular signaling molecules and receptors. Sleep deprivation can also disrupt the function of NMDA receptors, which are essential for synaptic plasticity in the hippocampus. Additionally, it can impair the cAMP/PKA pathway and increase GABAergic signaling, further impacting memory consolidation. Synaptic plasticity, essential for learning and memory, is regulated by various proteins and factors such as PSD95, NMDA receptors, and neuronal growth factors like BDNF and CREB. Overall, sleep deprivation has a profound impact on the molecular mechanisms underlying brain function and cognition. In conclusion, sleep deprivation could lead to neurobehavioral impairments, especially during critical brain development stages. The NMDA, AMPA, cAMP-PKA, and GABAergic pathways involving signaling molecules such as PSD95, are molecular targets that can be effectively targeted for therapeutic interventions.

Keywords : sleep deprivation, brain development, anxiety, depression, cognition

Count: 462
Abstract ID: 99
subject: Integrative system: Autonomic Regulation
Presentation Type: Oral

Methods for evaluation of autonomic nervous system functions: a review

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Background and Aim : The autonomic nervous system has a wide sensory and motor distribution that controls the function of the body's internal environment through the sympathetic and parasympathetic pathways. A change or disorder in the function of the autonomic nervous system can alter the activity of the whole body. Autonomic testing is indicated for patients with a history of syncope, orthostatic hypotension, postural tachycardia syndrome (POTS), thermoregulatory dysfunction, peripheral neuropathy, general autonomic failure, or neurodegenerative disease. Therefore, reviewing the available methods to evaluate the autonomic nervous system can be helpful for researchers and medical staff.

Methods : The methods used to evaluate the function of the autonomic nervous system are very diverse, through which sympathetic, parasympathetic, or both functions can be checked. Parasympathetic function was tested by measuring changes in heart rate in response to deep breathing, the Valsalva maneuver, the diving reflex test, and active standing. Sympathetic function is generally tested using the Valsalva maneuver, tilt table testing, active standing, standing squatting-standing, and cold pressor tests. The function of the cholinergic sympathetic system, known as the sudomotor system, is usually measured using the quantitative sudomotor axon reflex test (QSART), thermoregulatory sweat test (TST), or sympathetic skin response (SSR). Heart rate variability, as a valid parameter, evaluates autonomic function by focusing on heart beat intervals. The most well-known indicators of heart rate variability are heart rate and the standard deviation of heartbeat intervals (SDNN). Moreover, components of the low-frequency (LF) range are modulated by both the sympathetic and parasympathetic nervous systems, and are associated with baroreceptor activity. The components of the high-frequency (HF) range are modulated by the parasympathetic nervous system, which is connected to respiration and blood pressure changes. The LF/HF ratio reflects the interactions between both types of autonomic modulation. Furthermore, other tests are used to evaluate autonomic function across other systems such as

urodynamic testing in urology, gastric emptying studies in gastroenterology, and pupillometry in ophthalmology.

Results : The results were evaluated by comparing the mentioned methods between the normal amounts and the person being tested. Heart rate variability indices were reported based on the measurement unit (beats per minute, seconds, or Hertz). Systolic and diastolic changes of blood pressure are based on millimeters of Hg. The remaining tests had units based on the index to be measured. The difference between the values measured in each test and a normal person indicates a change in the autonomic nervous system, which can indicate a disorder in the sympathetic, parasympathetic, or both.

Conclusion : Considering that the autonomic nervous system is directly involved in the functioning and control of different parts of the body and also plays an important role in various diseases, it is possible to evaluate the health or the disorder created in it easily and with little cost in a non-invasive way at the research and therapeutic level by using the functional examination of the autonomic nervous system.

Keywords : Autonomic nervous system; sympathetic system; parasympathetic system; heart rate variability.

Count: 463
Abstract ID: 670
subject: Integrative system: Neural Circuits and Connectivity
Presentation Type: Poster

Unleashing the Power of Music: A Meta-Analysis of the Impact of Musical Training on Cognitive Performance and Intro Config Process

Submission Author: Mohammad Taha Nami

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In this meta-analysis, the effects of musical training on cognitive performance were investigated using a comprehensive search strategy and rigorous inclusion criteria. Results showed that musical training has a significant and positive effect on various cognitive domains, including attention, memory, and executive function. Furthermore, the magnitude of the effect was found to be moderated by several factors, including the duration and intensity of musical training, as well as the age of the participants. Overall, the findings of this meta-analysis provide strong evidence for the beneficial effects of musical training on cognitive performance. These results are of particular importance for educational and clinical settings, where musical training may serve as an effective tool for promoting cognitive development and enhancing cognitive function in individuals of all ages.

Keywords : Musical Training; Cognitive Performance; Music processing; Motor cortex;Intro config process; Texture entanglement

Count: 464
Abstract ID: 341
subject: Integrative system: Other
Presentation Type: Poster

Naringin and trimetazidine ameliorate baroreflex sensitivity and nucleus tractus solitarius electrical activity in acute kidney injury

Submission Author: Negin Amini

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Background and Aim : Objectives: Nucleus tractus solitarius (NTS) acts as the gateway to the central nervous system to enter sensory information that plays an important role in cardiovascular regulation. Peripheral baroreceptors, chemoreceptors and renal sympathetic afferent nerves create the primary synapse in the NTS. The aim of this study was to evaluate the effect of naringin (NAR (and trimetazidine)TMZ(alone and as combined on local field electrical activity of the NTS as local electroencephalography (EEG) and baroreflex sensitivity (BRS) sensitivity following renal ischemia/reperfusion injury (RI/R).

Methods : Forty male Sprague-Dawley rats (200- 250 g) divided randomly in 5 groups with 8 in each. 1) Sham, 2) RI/R, 3) TMZ; RI/R rats received TMZ (5 mg/kg, i.v) five minutes before reperfusion; 4) NAR; RI/R rats received NAR (100 mg/kg, i.p) once daily for seven days before RI/R; and 5) TMZ 5+ NAR100. The left femoral vein cannulated under anesthesia to infuse saline or TMZ and evaluate the baroreflex sensitivity. RI/R was induced by occlusion of renal pedicles bilaterally for 45 min followed by 4 hours reperfusion. NTS local electroencephalography (EEG) recorded before, during ischemia and throughout of reperfusion. Data were analyzed by RM-two way ANOVA. $p<0.05$ assigned as least differences between groups.

Results : NTS electrical waves didn't change during ischemia. While NTS electrical activity and BRS significantly decreased during reperfusion time ($p<0.001$). Pre-treatment of NAR and TMZ alone or their combination ameliorates NTS electrical activity and BRS in RI/R ($p<0.01$, $p<0.001$).

Conclusion : The results showed that RI/R injury lead to reducing BRS and NTS electrically activity. However, NAR and TMZ improved NTS electrical activity, and BRS. NAR and TMZ could be considered as promise agents to restore RI/R complications.

Keywords : Nucleus tractus solitaries, Barorefelex sensitivity; Naringin; Trimetazidine

Count: 465
Abstract ID: 330
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Oral

Predicting the value of the first spike latency in response to positive charge in intracellular recording data from healthy and unhealthy cerebellar purkinje cell using machine learning methods

Submission Author: Raheleh GhouchanNezhadNoorNia

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Background and Aim : This article emphasizes the significance of intracellular recording in neurophysiology, providing intricate insights into the neurons' function. It draws attention to the critical role of first spike latency in understanding swift neural responses to external stimuli, with potential implications spanning from fundamental neurobiology to cutting-edge artificial intelligence. The focus of this study is on utilizing state-of-the-art machine learning techniques to accurately predict this metric from whole cell patch recording data. Through meticulously crafted

experiments, a comprehensive dataset was obtained from both Control (Salin) and Experiment (Harmaline Toxicity) groups, laying the groundwork for developing precise predictive models. The study utilizes a diverse range of machine learning models, including Support Vector, MLP, Random Forest, and XGBoost, carefully selected for their effectiveness in the task at hand.

Methods : The passage dives into the method used for evaluating the models. A wide range of machine learning models such as Support Vector, MLP, Random Forest, and XGBoost were utilized to extract complex patterns from the captured neuronal responses. Rigorous testing was conducted to ensure the models' reliability, through a 10-fold cross-validation protocol. Each model was put to the test with different subsets of data, preventing overfitting and delivering a dependable measure of predictive accuracy. Essential metrics such as Mean Squared Error (MSE) and Mean Absolute Error (MAE) were employed to accurately evaluate the models' predictive capability.

Results : In this article, we explore the use of machine learning-based methods for predicting the first spike latency in response to positive charge in intracellular recording data. We collected data from a number of experiments for two groups: Control (Salin) and Experiment (Harmaline). This data has been used to train and test several machine learning models, including Support Vector, Multiple Layers Perceptron (MLP), Random Forest, and XGBoost regressions. Our results demonstrate that the ML-based methods can accurately predict the first spike latency for both groups. The best results are obtained by the ensemble learning based methods including random forest and XGBoost. These methods achieve an average mean squared error (MSE) of 0.0002 and an average mean absolute error (MAE) of 0.01 in 10-fold cross-validation.

Conclusion : This research solidifies the immense potential of employing machine learning techniques in forecasting the initial spike latency following intracellular recordings of positive charge. By conducting a small number of sample experiments on mice, we can reliably estimate the first spike latency in future experiments, eliminating the need for further animal testing. Additionally, through the use of machine learning, we can accurately identify the patterns in first spike latency changes among both healthy and unhealthy brain cells. This intelligent predictive system not only streamlines the experimentation process, but also allows for essential analyses to be carried out efficiently and effectively.

Keywords : First Spike Latency; Whole Cell Patch Clamp Recording; Machine Learning; Predictive Model

Count: 466
Abstract ID: 624
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Poster

Leveraging Machine Learning Algorithms for Brain Stroke Prediction: A Kaggle Dataset Analysis

Submission Author: Ehsan GhazanfariSavadkoohi

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Background and Aim : Brain strokes pose a significant threat to public health, necessitating accurate and timely prediction methods for preventive interventions. This study leverages machine learning algorithms to predict the occurrence of strokes using a Kaggle dataset. The dataset encompasses essential features such as gender, age, hypertension, heart disease, marital status, work type, residence type, average glucose level, and BMI. The objective is to explore the effectiveness of various machine learning algorithms in predicting strokes based on these features.

Methods : Six distinct machine learning algorithms were employed in this analysis: Decision Tree, Random Forest, Support Vector Machine (SVM), AdaBoost, Gradient Boost, and Neural Networks. The Kaggle dataset was preprocessed to handle missing values and encode categorical variables appropriately. The dataset was then split into training and testing sets for model training and evaluation. The algorithms were implemented using popular Python libraries such as scikit-learn and TensorFlow. Evaluation metrics such as accuracy and precision were utilized to assess the performance of each algorithm.

Results : Among the six machine learning algorithms tested, Random Forest emerged as the most effective predictor for brain strokes, achieving an impressive accuracy of 0.9 and a precision of 0.9. Random Forest's ability to handle complex relationships within the data, ensemble learning, and robustness against overfitting contributed to its superior performance. The importance of features in predicting strokes was also analyzed, revealing that age, average glucose level, and BMI were the most influential variables. These findings underscore the significance of considering multiple factors, including demographic and health-related features, in stroke prediction models.

Conclusion : In conclusion, this study demonstrates the efficacy of machine learning algorithms in predicting brain strokes based on a diverse set of features. The Random Forest algorithm proved to be the most accurate and precise among the tested models. The identified important features, age, average glucose level, and BMI, highlight the multifactorial nature of stroke prediction. These results provide valuable insights for healthcare practitioners and policymakers in developing targeted prevention strategies. As the field of machine learning continues to evolve, the integration of such models into clinical practice holds promise for enhancing stroke risk assessment and ultimately improving public health outcomes. Further research and validation on larger and more diverse datasets will be crucial to refining and generalizing these findings.

Keywords : Machine Learning, stroke , prediction

Count: 467
Abstract ID: 619
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Data Insights into Mental Health: A Machine Learning Examination of Political, Social, and Economic Influences

Submission Author: MohammadJavad Rajabi

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Background and Aim : Mental health is an essential part of people's lives and society. Poor mental health affects our well-being, our ability to work, and our relationships with friends, family, and community. Mental disorders, including anxiety, schizophrenia, depression, and bipolar disorder, are prevalent worldwide and impose a significant economic burden on individuals, households, communities, employers, healthcare systems, and government budgets. Machine learning models have been developed to predict mental health outcomes and crises using electronic health records and other data sources. These models have been shown to accurately predict which adolescents demonstrate above-average mental health difficulties and to identify the most important preadolescent risk factors in predicting adolescent mental health. However, these models suffer from difficulties with interpretation due to a lack of theoretical support. Integrating theoretical and machine-learning models can strengthen both approaches and accurately predict the level of mental health prevalence.

Methods : In this study we use data from 155 countries in 10-year intervals to address economic, social, and political risk factors that can predict the prevalence of Anxiety, Depression Bipolar disorder, and Schizophrenia, we use 22 predictor variables and uses multivariate supervised learning models we use all 4 disorder as the dependent variable with K-Nearest Neighbor (KNN), Linear regression (LR), Decision Tree (DT) Random Forest (RF) Artificial Neural Networks (ANN), Bagging Regression, Gaussian Process Regression(GPR) and XGBoost Algorithms

Results : We predict the prevalence of 4 mental disorders The best models are KNN, RF, Bagging Regression, and XGBoost with an R-squared of more than 96% in these 4 best models mean square error (MSE) is less than 0.001, and the mean absolute error(MAE) less than 0.02, GPR and DT are models with R-squared more than 90%, also MSE and MAE for these two models are less than

0.003 and 0.025 in our models' life expectancy, urbanization, smoking rate, the death rate from air pollution and usage unsafe water are best predictor variables that can better predict models

Conclusion : Using machine learning, this novel study establishes a mental prevalence model in different countries. The sophisticated computer algorithm can be implemented to improve our understanding of epidemiologic studies

Keywords : Machine Learning, Mental Disorders Prevalence, Epidemiologic Studies

Count: 468
Abstract ID: 671
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Comprehensive System Analysis and Simulation of Isolated Neuron(HMR)

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Background and Aim : Utilizing system analysis as the foundation for creating control algorithms aims to produce dynamic behaviors in real neural networks. This is essential for processing and transmitting biological information and therapeutic methods. Therefore, the integration of system analysis concepts such as equilibrium points, limit cycle in understanding the functional structure, model validation, pattern creation and controller design can be very vital. In practice, these cases can help the therapist to apply the appropriate external stimulation signal to desired dynamic and therapeutic behavior in the neural network.

Methods : In order to have a suitable representation model of a real Neuron; In the first step, by reviewing various articles, the HMR model is selected as the basic model; Next, system analysis is conducted to determine the location and type of equilibrium points, phase plane, Jacobian matrix and stability. Dynamic behaviors are then simulated and investigated in various scenarios. The scenarios are based on data from various articles and external stimulation signals (type, value, frequency, amplitude, bandwidth) and different initial conditions to compare modeling situations. Numerical simulation by MATLAB and Simulink has been conducted to comprehensively investigate the aforementioned scenarios.

Results : This article presents a comprehensive system analysis of HMR and its dynamic behavior under various input and initial conditions, marking the first of its kind. Considering different types of input results in various dynamic behaviors in Isolated neuron. The simulation results also indicate that the effect of initial conditions of the neuron remove during Time. Thus, in order to

create a pattern or observe specific behavior in an actual Neuron, the impact of factors such as the quantity and type of external stimulation signal and the initial conditions of the neuron has been analyzed.

Conclusion : By analyzing the system, we can comprehensively investigate the impact of input and initial conditions on dynamic behavior. By examining the eigenvalues in various scenarios, we can analyze the dynamic behavior of neuron. In other words, the presence of eigenvalues with a positive real part around the origin indicates periodic behavior. Our simulation shows for the first time that new inputs such as sawtooth and pulse can be used to create burst and spiky dynamic behavior in the isolated neuron. Also investigated impact of frequency in burst and spike behavior with different ISI index. The study examined the impact of the type and intensity of external stimulation signals on achieving dynamic behavior and the findings were simulated. In a more comprehensive manner, identifying the impact of input on dynamic behavior is the main cornerstone and an important step in designing a control algorithm to synchronize and achieve the desired collective behavior in the neural network.

Keywords : Neuron modeling; dynamic simulation; system analysis

Count: 469
Abstract ID: 666
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Dynamic Functional Connectivity Analysis Based on Extracted ROIs from Linear Mixed Effects Models in a Factorial Cue-Reactivity/Go-NoGo Task in Individuals with Methamphetamine Use Disorders

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Background and Aim : Cue-induced drug craving and disinhibition are two essential components of continued drug use and relapse in substance use disorders. Although these phenomena develop and interact over time, the temporal dynamics of their connectivity remain under-investigated. This study aims to investigate temporally dynamic brain functional connectivity that underlies methamphetamine cue-reactivity, response inhibition, and response inhibition during exposure to methamphetamine cues in individuals with methamphetamine use disorders (MUD), using data obtained from the fMRI of a novel mixed cue-reactivity/Go-NoGo task.

Methods : To explore the dynamic functional connectivity, we applied an analysis of time-varying activation to fMRI data from 62 men (age: 32.12 ± 5.89) with MUD at addiction treatment centers in Tehran, Iran. Using a sliding window approach across the task duration, we identified dynamically activated regions in three linear mixed-effects models (LMEs) for the following contrasts: cue-reactivity, response inhibition, and methamphetamine-related response inhibition. Regions of interest (ROIs) with a significant condition-by-time interaction effect were extracted after applying a False Discovery Rate (FDR) correction with a threshold of $p<0.001$. The overall functional connectivity analysis was performed on the entire signal between the significant regions

of interest (ROIs) extracted from each contrast using the CONN toolbox. The variation of connectivity was assessed at three-time steps.

Results : In the cue-reactivity contrast, the connectivity from the right medial amygdala (R-mAmyg) to the left rostral superior temporal gyrus (L-rSTG) increased over time, showing sensitization to drug cues and habituation to neutral cues. Conversely, the connectivity from L-rSTG to R-mAmyg decreased over time, indicating habituation to drug cues and sensitization to neutral cues. In the response-inhibition contrast, the connectivity from the right medioventral occipital cortex (R-MVOCC) to the right rostrodorsal inferior parietal lobule (R-rdIPL) increased in the second step and decreased in the third step. Additionally, the connection from the right precuneus (R-PCUN) to R-MVOCC decreased over time.

Conclusion : This study offers preliminary evidence that a mixed event-block Go-NoGo/cue-reactivity task can be utilized to assess the dynamic connectivity associated with cue-reactivity, response inhibition, and methamphetamine-related response inhibition.

Keywords : fMRI, Drug Cue-Reactivity, Response Inhibition, Functional Connectivity, Methamphetamine use disorder.

Count: 470
Abstract ID: 489
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

EEG Source Localization Using a Hybrid Spatiotemporal Recurrent Convolutional Neural Network

Submission Author: Mohammadreza Shahsavari

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Background and Aim : Electroencephalography (EEG) signals do not reflect the actual neural activities of the brain. Rather, these signals capture the electrical potentials that are generated on the scalp surface due to the superposition of electrical activities originating from different brain regions. In certain applications, it is important to locate the precise regions of the brain that are activated. However, localizing the source of focal electrical activities from EEG signals is a challenging problem that is highly ill-posed. The process of reconstructing the actual neural activities that underlie EEG signals usually requires the creation of an electromagnetic model of the human head and brain. This model serves to simulate how neural activities can produce EEG signals, and is therefore referred to as the EEG forward problem. Similarly, the process of reconstructing the neural activities that give rise to the observed EEG signals is known as the EEG inverse problem or EEG source localization.

Methods : This study introduces a new method for addressing the EEG source localization problem. The method consists of two main stages. First, simulated EEG data is generated by solving the EEG forward problem using a realistic electromagnetic head model. Second, the EEG inverse problem is solved using a hybrid spatiotemporal recurrent convolutional neural network. For the first part, as there are limited annotated EEG signals available for specific source locations, the study adopts the finite element method (FEM) to create an electromagnetic head model to

generate simulated data that will serve as part of the training signals. The standard MNI brain atlas is used to create the electromagnetic model of the human head. The conductivities of the white matter, skull, scalp, gray matter, and CSF are set to 0.33, 0.0024, 0.43, 0.14, and 0.179 respectively. 3000 EEG signals with 128 channels are generated by placing an electrical dipole in random locations within the gray or white matter of the brain, following 10-20 electrode placement standards. Random noise is added to the simulated EEG data for a more realistic simulation. Next, a new neural network has been proposed, called a hybrid spatiotemporal recurrent convolutional neural network to localize the source of EEG signal and solve the EEG inverse problem. It utilizes convolutional neural networks (CNNs) and long-short-term memory (LSTM) layers to locate the neural activities that produce the EEG signals. The algorithm was trained and evaluated using simulated EEG data acquired from the electromagnetic head model.

Results : Our model was trained on a dataset of 3000 simulated EEG signals, and we further evaluated its performance on a hold-out test set of simulated EEGs. Our proposed methodology successfully demonstrated a mean error distance of 4.18 ± 2.71 mm in localizing the source of the electrical activity, indicating a promising performance.

Conclusion : The proposed spatiotemporal recurrent convolutional neural network effectively solves the EEG inverse problem, even in the presence of noisy signals, as demonstrated by the good robustness of the results on simulated data. The method employs data-driven learning to overcome the highly ill-posed linear inverse problem, yielding promising outcomes.

Keywords : EEG, EEG Source Localization, Deep Learning

Count: 471
Abstract ID: 575
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

A Hybrid Deep Cross-Channel Correlation and Attentive Spatio-Temporal Representation Learning Model for Parkinson's Disease Diagnosis Using Resting State EEG

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Background and Aim : Parkinson's disease (PD) is a complex condition to diagnose accurately due to the lack of specific tests and symptoms overlap with other diseases. To improve diagnostic accuracy, computer-aided techniques are being employed that use electroencephalography (EEG) for detection and analysis. However, current computer-aided diagnostic methods only focus on spatiotemporal features from individual EEG channels. This study aims to develop a diagnostic technique that incorporates valuable information from channel correlations, in addition to spatiotemporal characteristics, to enhance diagnostic accuracy. By leveraging information on both dynamic interactions between brain regions provided by channel correlation maps and spatiotemporal characteristics in EEG signals, we propose an accurate PD diagnostic framework.

Methods : Our novel deep learning based approach to EEG feature extraction for PD diagnosis involves using two distinct modules - cross-channel correlation learning (CCL) and attentive spatiotemporal representation learning (ASTRL). The CCL module effectively aggregates channel dependencies, while the ASTRL module is designed to aggregate spatiotemporal information across the time axis. By integrating these two modules, our goal is to achieve an innovative and effective solution to the problem of EEG feature extraction for PD diagnosis. To train and evaluate our deep learning model, we utilized a publicly available dataset from the University of San Diego consisting of 15 PD patients and 16 age-matched healthy control subjects. Our model uses a 2-second segment of 32-channel resting state to diagnose PD. We preprocessed the data by

downsampling all EEGs to 256 Hz and segmenting them into 2-second intervals. Then, we applied a Butterworth band-pass filter with a cut-off frequency range of 0.5 to 64 Hz to each EEG channel. During the training process, the data first flows through the CLL module, which is a transformer model that receives the data in a channel-wise manner instead of seeing the time samples. The CLL module learns a map of the correlations between the input channels and passes the learned information to the next ASTRL module. The ASTRL module then receives the modified form of the data passed to it by the previous CLL module, as well as the raw data passed to it using a skip connection. The ASTRL module itself consists of two distinct parts – Long-short term memory (LSTM) layers and an additive attention mechanism. The LSTM layers are responsible for extracting spatiotemporal features, while the additive attention mechanism weights the important parts of the input data.

Results : Our proposed model was trained and evaluated in a subject-independent manner to demonstrate its ability to work on unseen subjects. To enhance the reliability of our findings, we employed a 10-fold cross-validation strategy. Our model achieved impressive results with an AUC of 0.998, accuracy of 0.990, sensitivity of 1, specificity of 0.982, PPV of 0.981, and F1-score of 0.990.

Conclusion : Our approach combines channel correlation and spatiotemporal information from EEG data to provide advanced diagnostic capabilities for Parkinson's Disease patients, achieving state-of-the-art performance compared to previous studies.

Keywords : Parkinson's disease, EEG, Deep Learning

Count: 472
Abstract ID: 564
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Predicting the Relationship between Motor Behavior and Cerebellar Purkinje cell Firing Patterns in Rats Using AI-Based Approaches

Submission Author: Raheleh GhouchanNezhadNoorNia

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Background and Aim : The cerebellum plays a vital role in coordinating movement, and Purkinje cells are essential for ensuring smoothness, speed, and motor execution's accuracy. These cells receive inputs from the spinal cord, which are influenced by voluntary behavioral patterns and regulate their firing patterns accordingly. The relationship between motor behavior and spike patterns in Purkinje cells is established through the modulation of intrinsic cell excitability and received synaptic inputs, both of which are influenced by motor behavior. Machine learning (ML) algorithms can be trained to detect specific firing patterns or changes in spike activity that may be associated with different motor behaviors. By analyzing the recorded data of cell activity in rat,

ML algorithms seem capable of identifying specific firing patterns or changes associated with motor behavior.

Methods : The study collected data on Purkinje cell activity, including spike frequency, peak amplitude, action potentials half width, time to peak, coefficient of variation of interspike interval (CV[ISI]), after hyper polarization (AHP) and motor behavior of rats, including total distance and speed of movement. Missing values were imputed using mean imputation, and data values were scaled between zero to one to avoid potential biases and distortions caused by different scales. The correlation between independent variables related to Purkinje cell activity and two dependent motion variables was measured. Non-linear regression models based on ML were used to predict the relationship between motor behavior variables and Purkinje cell patterns in control and Harmaline-treated rat groups. MATLAB software version R2019a was used, the cross-validation method employed was one-leave-out, and the RMSE-criteria was used to evaluate the method's performance.

Results : The study revealed that linear regression may not always be suitable for biological processes due to their complex and non-linear nature. In the control group, a strong linear correlation was observed between all together independent variables and the total distance of rat movement, with an R2 value of 84.58%. Similarly, in the test group, a significant correlation was found between all together independent variables and the speed of rat movement, with an R2 value of 78.47%. However, linear regression has limited generalizability and higher error rates. Instead, non-linear regression ML methods proved to be more effective. The Coarse Gaussian SVM method performed the best in predicting movement duration for both the control and test groups, with RMSE values of 0.13102 and 0.14833, respectively. For predicting movement speed in the control group, the Medium Gaussian SVM method achieved the best result with an RMSE of 0.11473, while in the test group, the squared exponential kernel Gaussian process method produced the best result with an RMSE of 0.1364.

Conclusion : Based on the study's findings, Coarse Gaussian SVM was the best method for predicting movement duration in both groups, while Medium Gaussian SVM and Squared Exponential Kernel Gaussian Process were more appropriate for predicting movement speed due to the complexity and non-linearity of the data in that appeared in the test group after Harmaline treatment. These results highlight the potential of ML in identifying motor behavior models with electrophysiological activities in Purkinje cells.

Keywords : Prediction, AI-based Approach, Motor Behavior and Cerebellar Purkinje cell,

Count: 473
Abstract ID: 407
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

"Computational Modeling of Treatment Response to Transcranial Direct Current Stimulation (tDCS) on Fibromyalgia Pain Intensity "

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Background and Aim : -Transcranial Direct Current Stimulation (tDCS) has emerged as a promising non-invasive neuromodulation technique for reducing the pain intensity in fibromyalgia. However, it requires a time commitment for the patient and physician and the uncertainty of response make patient and caregivers think twice about using this approach. Fibromyalgia is characterized by widespread pain and is often accompanied by co-occurring symptoms of anxiety and depression, presenting a significant challenge for an effective treatment plan. Developing biomarkers to predict the tDCS treatment response is needed. Clinical experience suggests that pain alleviation by tDCS may follow a nonlinear pattern where the largest effectiveness is seen initially followed by more subtle improvements. And then attenuation of treatment response by passing time from the last stimulation.

Methods : - Our study conducted a systematic review of existing literature using the PRISMA method, Seven electronic databases (PubMed, Scopus, Embase, PsycINFO, Web of Science, Cochrane, and CINAHL Complete) were searched for records in English. Studies that reported longitudinal clinical outcome data from fibromyalgia patients treated with tDCS. We collated data encompassing pain intensity reported in the Visual Analogue Scale (VAS) at multiple time points before, during, and after tDCS sessions. A nonlinear mixed-effects model on group-level longitudinal clinical outcomes was applied to predict temporal treatment response patterns in fibromyalgia patients undergoing tDCS.

Results : -The systematic review yielded a compilation of data from previously published studies, collectively representing a substantial cohort of fibromyalgia patients who received tDCS treatment. Analysis of the longitudinal clinical outcome data revealed dynamic patterns of treatment response over time. Notably, tDCS was associated with significant reductions in pain

intensity at the initial stage and the end of sessions of the treatment. The computational model demonstrated that individual variations and different stimulation protocols play a pivotal role in the temporal evolution of these clinical outcomes. An initial response to treatment can relatively help predict tDCS response.

Conclusion : This systematic review and computational modeling approach, utilizing exclusively longitudinal clinical outcome data from previously published studies, provides valuable insights into the dynamic nature of tDCS treatment response in fibromyalgia. The findings underscore the significance of analyzing temporal trends in pain for personalized treatment optimization. which is severely underrecognized in the current literature. Furthermore, our research contributes to the growing body of knowledge surrounding neuromodulation techniques in chronic pain. Our results also suggest the value of investigating initial response as a biomarker in predicting expected treatment response. By accounting for the evolving patterns of treatment response, we aim to advance the development of more effective and personalized tDCS interventions for fibromyalgia patients, ultimately enhancing their quality of life.

Keywords : Computational Modeling, Fibromyalgia, tDCS, treatment, temporal

Count: 474
Abstract ID: 362
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

A Mechanistic Insight into Sources of Error of Visual Working Memory in Multiple Sclerosis

Submission Author: Ali Motahharynia

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Background and Aim : Working memory (WM) is one of the most affected cognitive domains in multiple sclerosis (MS), which is mainly studied by the previously established binary model for information storage (slot model). However, recent observations based on the continuous reproduction paradigms have shown that assuming dynamic allocation of WM resources (resource model) instead of the binary hypothesis will give more accurate predictions in WM assessment. Moreover, continuous reproduction paradigms allow for assessing the distribution of error in recalling information, providing new insights into the organization of the WM system. Nonetheless, they have not been employed in the field of MS despite their influence in uncovering novel mechanistic insights into the WM organization.

Methods : A total of 121 patients with MS (61 relapsing-remitting and 60 secondary progressive) and 73 healthy controls were enrolled in this study. The precision of visual WM was measured using a memory-guided localization (MGL) paradigm and analog recall tasks with sequential presentation. The classifying performance of these paradigms in distinguishing different groups was assessed using receiver operating characteristic analysis. Moreover, the distribution of error in recalling information was evaluated by computational modeling on the outcomes of sequential paradigms.

Results : Our results demonstrated an overall increase in recall error and decreased recall precision in MS. While sequential paradigms were better in distinguishing healthy control from relapsing-remitting MS, MGL were more accurate in discriminating MS subtypes (relapsing-remitting from secondary progressive), providing evidence about the underlying mechanisms of WM deficit in progressive states of the disease. Furthermore, computational modeling of the results from the sequential paradigm determined that imprecision in decoding information and swap error (mistakenly reporting the feature of other presented items) were responsible for WM dysfunction in MS.

Conclusion : Overall, this study offered a sensitive measure for assessing WM deficit and provided new insight into the organization of the WM system in the MS population.

Keywords : Binding; Multiple sclerosis; Resource model; Swap error; Working memory

Count: 475
Abstract ID: 371
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Multi-View Sequential Model for Automatic Parkinson's Disease Detection Using EEG Signals

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Background and Aim : Parkinson's disease (PD), characterized by symptoms such as slow movement, tremors, and rigidity, stands as one of the most prevalent neurodegenerative disorders. The high incidence rate, substantial disability, and challenges associated with early diagnosis have made PD a focal point in neuroscience. Diagnosis primarily hinges on clinical symptoms, but these symptoms only become apparent once there has been a significant loss of dopamine neurons in the substantia nigra. Early-stage PD displays diverse clinical manifestations with a lack of clear objective indicators, leading to a high rate of misdiagnosis. Recent studies have uncovered the critical role of abnormal neural oscillations within and between multiple brain regions in generating motor symptoms through invasive neural recordings. Additionally, progress has been made in using non-invasive electroencephalogram (EEG) studies to extract features from cortical oscillations for PD diagnosis, though this remains a challenging endeavor.

Methods : This study employed the Uc San Diego Dataset, which played a crucial role in model training and validation. The dataset comprised 15 subjects diagnosed with PD, including 8 females and 7 males, with an average age of 63.2 ± 8.2 years. It also featured 16 age-matched healthy control subjects, with 9 females and 7 males, and an average age of 63.5 ± 9.6 years. While previous approaches have mainly focused on learning from raw EEG signals or their derived time-frequency image representations, learning from multi-view inputs (i.e., both the raw signals and the time-frequency images) for PD detection is a challenging and less understood task. In response,

this study proposes a sequence-to-sequence PD detection model capable of learning a joint representation from both raw signals and time-frequency images. To account for varying generalization and overfitting rates across different views, the proposed network adapts the learning pace on each view based on their respective behavior.

Results : To assess the performance of the proposed model, a 10-fold cross-validation and a subject-independent test were conducted. The experimental results on the Uc San Diego dataset consistently demonstrated the superior performance of the proposed model over single-view baselines and a multi-view baseline with a simple fusion strategy, achieving an accuracy of 99%, sensitivity of 100%, and the specificity of 98%. Furthermore, this model outperforms previous PD detection methods and advances the state-of-the-art results on the experimental database.

Conclusion : In this paper, we introduced a sequence-to-sequence network architecture for automated PD detection, enabling simultaneous learning from both raw signals and time-frequency input. The network design incorporates two network streams, one for each input view, with a focus on robustness to training data size, complementarity between network streams, and awareness of the generalization and overfitting behavior of these streams. Empirical evaluation demonstrated that not only did this model outperform the baselines, but it also surpassed existing works on the Uc San Diego dataset.

Keywords : Deep learning; Parkinson’s disease; EEG; Diagnostics

Count: 476
Abstract ID: 372
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Multi-View Sequential Model for automatic identification of schizophrenia based on EEG signals using dynamic functional connectivity analysis

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Background and Aim : Schizophrenia (ScZ), a complex and debilitating mental disorder, profoundly impacts the human brain, resulting in profound disturbances in emotional well-being, interpersonal relationships, and the broader healthcare system. The multifaceted challenges posed by ScZ necessitate innovative approaches for understanding and diagnosing this condition. In recent years, the field of deep learning has garnered significant attention, particularly with a focus on connectivity analysis applied to functional magnetic resonance imaging (fMRI) data. This emerging trend has provided fresh insights into the neural underpinnings of various mental health conditions. In line with these advancements, the present study embarks on an exploration of electroencephalogram (EEG) signals as a means to unravel the mysteries of ScZ. We seek to investigate the potential of utilizing dynamic functional connectivity (DFC) analysis, coupled with the power of deep learning methods, to identify ScZ from EEG data. This research aims to bridge the gap between traditional neuroimaging approaches and the cutting-edge techniques that hold promise for revolutionizing our understanding and diagnosis of this challenging disorder.

Methods : The publicly ScZ EEG dataset collected from Lomonosov Moscow State University (LMSU) is used to evaluate the performance through the proposed method in this study. The dataset contains 84 subjects which includes 45 ScZ subjects and 39 HC subjects. Each subjects' data is 60-s resting eye-closed state from 16 channels. While previous approaches have mainly focused on learning from raw EEG signals, their derived time-frequency image or DFC

representations, learning from multi-view inputs (i.e., both the raw signals and the DFC images) for ScZ detection is a challenging and less understood task. A time-frequency domain functional connectivity analysis through cross mutual information algorithm is proposed to extract the features in alpha band (8–12 Hz) of each subject. In response, this study proposes a sequence-to-sequence ScZ detection model capable of learning a joint representation from both raw signals and DFC. To account for varying generalization and overfitting rates across different views, the proposed network adapts the learning pace on each view based on their respective behavior.

Results : To assess the performance of the proposed model, a 10-fold cross-validation and a subject-independent test were conducted. The experimental results on LMSU dataset consistently demonstrated the superior performance of the proposed model over single-view baselines and a multi-view baseline with a simple fusion strategy, achieving a 97.74 ± 1.15% accuracy, 96.91 ± 2.76% sensitivity and 98.53 ± 1.97% specificity.

Conclusion : In this paper, we introduced a sequence-to-sequence network architecture for automated ScZ detection, enabling simultaneous learning from both raw signals and DFC representation input. The brain connectivity analysis is applied and implemented using mutual information algorithm. The network design incorporates two network streams, one for each input view, with a focus on robustness to training data size, complementarity between network streams, and awareness of the generalization and overfitting behavior of these streams. Empirical evaluation demonstrated that not only did this model outperform the baselines, but it also surpassed existing works on the LMSU dataset.

Keywords : Deep learning; schizophrenia; EEG; Diagnostics

Count: 477
Abstract ID: 244
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

Development of a Regional-Based Predictive Model of Incidence of Traumatic Spinal Cord Injury Using Machine Learning Algorithms

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Background and Aim : In the present study we aimed to develop a predictive model of incidence of traumatic spinal cord injury (TSCI).

Methods : The data for training the model included both the incidence data and the covariates. The incidence data were extracted from systematic reviews and the covariates were extracted from data available in the international road federation database. Then the feature processing measures were taken. First we defined a hyper-parameter, missing-value threshold, in order to eliminate features that exceed this threshold. To tackle the problem of overfitting of model we determined the Pearson correlation of features and excluded those with more than 0.7 correlation. After feature selection three different models including simple linear regression, support vector regression, and multi-layer perceptron were examined to fit the purposes of this study. Finally, we evaluated the model based on three standard metrics: Mean Absolute Error, Root Mean Square Error, and R^2.

Results : Our machine-learning based model could predict the incidence rate of TSCI with the mean absolute error of 4.66. Our model found "Vehicles in use, Total vehicles / Km of roads", "Injury accidents / 100 Million Veh-Km", "Vehicles in use, Vans, Pick-ups, Lorries, Road Tractors", "Inland surface Passengers Transport (Mio Passenger-Km), Rail", and "% paved" as top predictors of TSCI.

Conclusion : Our model is proved to have a high accuracy to predict the incidence rate of TSCI for countries, especially where the main etiology of TSCI is related to road traffic injuries. Using this model, we can help the policymakers for resource allocation and evaluation of preventive measures.

Keywords : Traumatic spinal cord injury; Machine learning; Incidence

Count: 478
Abstract ID: 79
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

A new statistic for steady-state evoked potentials: new insights into attention

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Background and Aim : Steady-state evoked potentials (ssEP) provide a high signal-to-noise-ratio measure of brain function. The intra-individual variability of ssEP is a unique individual signature revealing the study participant's ability to sustain attention. We present how to measure the intra-individual variability of a frequency component extracted from ssEP data and how to compare means of multiple groups of Fourier measurements corresponding to multiple experimental conditions within participant(s) or multiple groups of participants within a condition.

Methods : A frequency component of interest is extracted from ssEP data using the Fourier transform. The discrete Fourier measurements are represented on the two-dimensional complex plane and modeled using an ellipse. The ellipse is centered on the mean response. The Length and Width of the ellipse are the square roots of the maximum and minimum eigenvalues derived from the covariance of the real and imaginary components of the Fourier estimates, respectively. The Length-to-Width Ratio (LWR) is an individual index of the participant's ability to maintain attention on a target. We present how to calculate the confidence interval of the LWR enabling us to test whether the LWR is significantly greater than 1 and to compare the LWR between study participants. When the LWR is significantly greater than 1, it reveals a significant fluctuation in brain response presumably as a function of attention. However, in experiments where no attention fluctuation is assumed during and across the trials, the LWR is not significantly greater than 1. For such experiments, we present a new statistic, called Fcirc statistic, to compare the means of multiple clusters of Fourier measurements whether the multiple groups have equal or unequal variances and/or numbers of samples. Fcirc statistic derives from Welch's test but for multiple comparisons.

Results : We demonstrated the validity of the statistical methods using numerical simulations. Unlike multivariate analysis of variance (MANOVA), Fcirc statistic provides a constant type-I error at 0.05 whether the multiple groups have equal or unequal variances and/or numbers of samples. Moreover, the probability of achieving a significant result depends on the total length of ssEP data and is independent of the time duration chosen to perform the Fourier transform on a fixed length of ssEP data.

Conclusion : The LWR as an individual index of ability to control attention enables us to distinguish individuals with different cognitive capabilities, to differentiate cases with attention deficit from healthy participants, and to objectively monitor the effects of therapeutic interventions on attention in cases with poor control of attention. The Fcirc statistic enables us to compare the brain responses of participant(s) between multiple conditions or of multiple groups of participants within a condition.

Keywords : Evoked Potential, Attention, Fourier analysis, Welch's test, Multivariate analysis of variance (MANOVA)

Count: 479
Abstract ID: 133
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Exploring Brain Energy Modeling: Insights into Autism Spectrum Disorder

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Background and Aim : In recent times, there has been a growing interest among neuroscientists in understanding how the brain's energy is modeled. Various methods rooted in statistical mechanics have been employed to evaluate brain energy [1-3]. This study, however, takes a unique approach by utilizing the physical Ising model to calculate brain energy. Our research delves into the intricacies of the energy function to differentiate between individuals with autism and healthy control subjects within the framework of canonical brain networks. We also investigate the potential association between brain energy and the expression of autism symptoms. This exploration promises valuable insights into the relationship between brain energy and autism, clearing up a fascinating aspect of neurological research.

Methods : We carefully selected 73 individuals diagnosed with autism and 98 healthy control subjects from the ABIDE preprocessed dataset. All subjects underwent standard preprocessing procedures using the CPAC (Configurable Pipeline for the Analysis of Connectomes) pipeline, ensuring data consistency and quality. Regional time series were extracted based on the CC200 atlas, enabling us to focus our analysis on specific brain regions of interest. We computed functional connectivity measures to capture the interactions between brain regions, which were essential for our energy model. Using the physical Ising model, we calculated the energy levels for the brain over canonical networks, providing a quantitative measure of brain energy. We conducted pairwise comparisons of the energy levels among canonical networks to discern differences. Employing nonparametric statistical tests, we compared the energy levels of canonical networks between autistic patients and healthy subjects to identify significant differences. Finally, we performed correlation analyses to investigate the relationship between energy values within specific subnetworks and clinical measures of autism. This step aimed to reveal potential associations between brain energy and autism symptoms.

Results : Significant differences in energy levels were observed among canonical brain networks. Particularly, subcortical and limbic regions exhibited notably higher energy levels, while the default mode network showed the lowest energy compared to other regions. Notably, the study unveiled subtle yet discernible distinctions between the two groups. There was a trend towards significance (nonparametric p-value = 0.076) in limbic region energy, suggesting statistically significant differences (nonparametric p-value = 0.029) in frontoparietal cortex energy between the healthy control and autistic groups. Intriguingly, positive correlations were identified between the energy levels of subcortical, visual, and dorsal attention regions and various clinical measures related to social, motor, and affective dysfunction in individuals diagnosed with Autism Spectrum Disorder.

Conclusion : Our research underscores the significance of considering brain energy in the context of ASD, offering a promising avenue for future investigations. By delving into the intricate relationships between brain energy and autism symptoms, we aim to contribute to a more comprehensive understanding of this neurodevelopmental disorder. This exploration not only deepens our knowledge of brain function but also holds the potential to inform novel therapeutic strategies and interventions for individuals on the autism spectrum.

Keywords : Brain Energy, Autism Spectrum Disorder, Ising model, Brain Modeling

Count: 480
Abstract ID: 578
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

Decoding visuospatial Working Memory based on spike times within visual areas relative to frontal beta oscillation

Submission Author: AbdolShakoor Mohammadi

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Background and Aim : Working memory (WM) is a cognitive ability to temporarily maintain information to use in future and influences our goal directed behaviors. It is an important component of higher cognitive functions such as attention and decision making. As stated by [Bahmani, et al. (2018)], WM is not decoded in the form of rate coding with in visual areas and the content of WM is reflected in relations between the spikes and the phases of ongoing oscillations. Consequently, we can introduce a phase decoder based on the machine learning algorithms to be able to decode the content of WM.

Methods : In our study, electrophysiological data was recorded from two macaque monkeys during a Memory Guided Saccade (MGS) task. Monkeys fixated on a central point, and visual cue stimuli were presented at specific locations. Local Field Potentials (LFP) and Spiking activities were recorded from the Frontal Eye Field (FEF) and V4 areas. LFP signals were filtered in different frequency bands, and instantaneous phases were computed. Then we examined the relation between spike times of V4 and phases of ongoing oscillations in V4 and FEF for decoding the content of WM. Consequently, four feature extraction approaches were considered: Spike Phase Locking (SPL) between spikes of V4 and phases of V4 LFPs, Spike Phase Locking (VSPL) between spikes of V4 and phases of FEF LFPs, Spike Phase Locking between spikes of V4 and phase differences of V4 and FEF LFPs and Phase-Phase Locking (PPL) between LFPs of two recorded areas. Additionally, spike count rates and neuron firing rates were determined. Classification was performed using an ensemble-based binary classifier with a Gradient Descent Optimizer (GDO). Furthermore, 20% of the data was reserved for testing, and 5-fold cross-validation was used for hyper parameter tuning.

Results : We measured p-values and F-statistics using Circular ANOVA for the extracted features (SPL of V4, VSPL of FEF, PPL of V4-FEF, and SPL of phase differences). The average F-stat of circular ANOVA for VSPL of FEF increased significantly in the 8-18 Hz frequency range compared to SPL of V4 and V4-FEF's PPL (Δmax F-stat = 7.79 ± 0.6478, $p < 0.001$). The performance was significantly higher for VSPL of FEF compared to SPL of V4 and V4-FEF's PPL ($p < 0.001$, Wilcoxon signed-rank test). Using all features significantly improved classifier performance over VSPL of FEF (56.9% of neurons, $p < 0.05$), SPL of V4 (96.55% of neurons, $p < 0.005$), and V4-FEF PPL (91.38% of neurons, $p < 0.005$). The best performance was achieved by VSPL of FEF, but using the combination of all features improved accuracy by approximately 6.3%, highlighting the importance of VSPL of FEF.

Conclusion : Therefore, a combination between spike times in visual areas relative to the ongoing beta oscillations with in FEF can reveal the content of WM. Phase decoding can be considered as a decoding mechanism in consistent with brain's biology and its rapid information decoding functionality.

Keywords : Phase Coding; Machine Learning; Neural Coding; Working Memory; Signal Processing; Neural Networks

Count: 481
Abstract ID: 250
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Investigating and analysis types of excitability in generalized Fitzhuge-Nagumo planar model from dynamical systems point of view

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Statement of problem: At the root of neuronal signaling, excitability is a dynamical property shared by all neurons, but its electrophysiological signature largely differs across neurons and experimental conditions. In the early days of experimental neurophysiology, Hodgkin identified three distinct types of excitability (today called Types I, II, and III) by stimulating crustacean nerves with constant current stimuli. The three types of excitability have long been associated to three distinct mathematical signatures in conductance-based models. They all can be described in planar models of the FitzHugh type, which can be rigorously associated to the mathematical reduction of high-dimensional models (for instance, the planar reduction of the Hodgkin–Huxley model). However, understanding excitability in detailed conductance- based models remains a challenge, especially for neurons that exhibit transition between distinctively different firing types depending on environmental conditions. 2. Research purposes: Our goal is to investigate and qualitatively analyze the generalized Fitzhuwe-Nagomo model, which provides new insight into the classification of excitability types. The generalized model is a mirrored version of the planar Fitzhuwe-Nagomo model, which is motivated by the mathematical reduction of conductance-based models including calcium channels. The cooperative nature of calcium channel activation makes the contribution of these channels to excitability different from competitive gating variables such as sodium channel inactivation or potassium channel activation. This difference is responsible for changing the phase portrait, which cannot be reproduced in the Fitzhuwe-Nagomo model. The degenerate pitchfork bifurcation (codimension 3) organize excitability into five different types. The three first types correspond to the types of excitability extensively studied in the literature. They are all competitive in the sense that they involve only a region of the phase plane where the model recovery variable is purely competitive. In addition, the model reveals two new types of excitability (Types IV and V) that match the distinct electrophysiological signatures of conductance-based models of high density calcium channels. We prove that these two new types of excitability cannot be observed in a purely competitive model such as the FitzHugh–Nagumo model. 3. Research Methodology: In this research work, we use the approach of dynamical systems and geometrical methods to investigate and analyze the phase portrait and bifurcation diagram of the generalized Fitzhuge-Nagomo planar model

Keywords : neuronal excitability; planar neuron model; bifurcation unfolding; competitive and cooperative variables; voltage-gated calcium channels

Count: 482
Abstract ID: 181
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Drug discovery in exploring potential inhibitors of the enzymes involved in laminopathy in Alzheimer's disease; In-silico study

Submission Author: Armin Ariaei

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Background and Aim : Alzheimer's disease (AD), an upgrowing case of memory impairment, is manifested by a specific pathophysiology condition known as laminopathy. Laminopathy is one of the pathological manifestations of Alzheimer's disease leading to neuron apoptosis. In this study, the association between the enzymes assumed to be involved in laminopathy was evaluated. Furthermore, a drug screening was conducted to find the potential small molecules inhibited enzymes that participated in lamin cleavage.

Methods : The mRNA expression of the cathepsin L and B, caspase 3 and 6, lamin b1 and b2, granzyme A and B, along with lamin A/C were analyzed through Pearson correlation and Kruskal-Wallis test from GSE5281 and GSE28146 datasets. A total number of 143 ligands structurally similar to the inhibitors of selected enzymes were implemented through molecular docking. Subsequently, 100 ns molecular dynamics (MD) with NAMD and Martini 3 were performed for two selected ligands.

Results : The expression level of the mRNAs highlighted caspase 6 and lamin A/C upregulation in the hippocampus of the AD samples, in contrast to cathepsin B, lamin b2, and caspase 3. Moreover, there was a strong correlation between the expression level of cathepsin B, lamin A/C, and caspase 6 in the AD group. Besides, in exploring potential inhibitors for the enzymes involved in the laminopathy, molecules with PubChem id of 608841 and ChEMBL id of 550872 were selected. Eventually, the MD results suggested the molecule with PubChem id of 608841 ($C_{18}H_{12}F_3NO_2S$) to be more stable in complex with the receptor.

Conclusion : The strong association between lamin A/C, cathepsin B, caspase 6, as well as cathepsin L and lamin b2 specified laminopathy as the potential factor of apoptosis in AD. Inhibiting caspase 3 and 6, along with cathepsin L and B, simultaneously, suggested to decrease the rate of apoptosis triggered by lamin degradation.

Keywords : Laminopathy; Alzheimer's Disease; Molecular Dynamics; Transcriptome

Count: 483
Abstract ID: 95
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

Design a diagnostic assistant for early Alzheimer's disease detection using deep learning methods on magnetic resonance imaging

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Background and Aim : Alzheimer's disease is a debilitating condition that results in a gradual decline in cognitive function and memory. This illness places a considerable burden on patients, their families, and healthcare systems alike, highlighting the need for effective treatments and support. We know that Alzheimer's disease progresses through six distinct stages, starting with a healthy baseline and culminating in the final stage of the disease. Early diagnosis is critical for effective intervention and management, as therapeutic interventions are most efficacious in the nascent stages of the disease. The focal point of our investigation lies in the utilization of MR images as a primary diagnostic modality. MRI is crucial in detecting brain structural changes in Alzheimer's disease due to its high resolution. Deep learning applied to MRI data revolutionized neuroimaging. CNNs extract intricate spatial and temporal features, yielding unparalleled insights into brain structure and function. This improves the detection of neurological disorders, allowing early intervention. Deep learning with MRI heralds a new era in precision medicine.

Methods : Our methodology systematically used deep learning to analyze an imbalanced MRI dataset from the ADNI database which consists of four main parts. In this study, we utilized 20230 MRI images collected from 1428 male and 1326 female patients at various stages of the disease. In the first step, we conducted meticulous data preprocessing, which included histogram normalization, resizing, and handling missing values. However, we did not create any new data. Then, in the realm of model selection, we carefully deliberated on the most fitting deep learning

architectures for our neuroimaging study. Before designing the model for our software development, we found it crucial to examine the current deep-learning models. Therefore, considering the unique characteristics of MRI data, we opted to include Residual Neural Network (ResNet), VGG Network, Efficient Network, and Inception Network. In the part about training the selected model, we partitioned the data into training, testing, and validation sets, subjecting the model to an iterative refinement process, and due to the stated conditions, we evaluated the macro-average f1-score.

Results : In the previous sections, we mentioned that the designed model used MRI data to detect the correct stage of the disease. To evaluate the model, we measured its macro-average f1-score. Below are the results we obtained: The model performance evaluation indicates that the EfficientNet model outperformed the other models of our research in terms of macro-average f1-score, achieving a remarkable 97.67. VGG16 scored 82.78, ResNet101 scored 86.85, and InceptionV3 scored 95.31. Upon analyzing the MRI data, we discovered that EfficientNet can more accurately detect early-stage Alzheimer's pathology than other models.

Conclusion : This study shows that early detection of Alzheimer's disease is possible with deep learning methods applied to MRI data. The utilization of EfficientNet has been demonstrated to be efficacious in precisely identifying the onset of Alzheimer's disease in its early stages. Our aim is to develop a diagnostic assistant that utilizes advanced AI-powered deep learning algorithms to identify subtle neuroanatomical patterns that may serve as early indicators of Alzheimer's pathology.

Keywords : Alzheimer’s disease; deep learning; classification; early diagnosis; MRI datasets; ADNI database; pre-trained models.

Count: 484
Abstract ID: 50
subject: Computational Neuroscience: Network Models
Presentation Type: Oral

Stimulation-induced synaptic reorganization is shaped by inhibitory plasticity in a reduced model of Parkinson's disease

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Background and Aim : The reciprocal interaction between inhibitory neurons of the globus pallidus externus (GPe) and excitatory neurons of the subthalamic nucleus (STN) forms an intrinsic pacemaker in the basal ganglia (BG). Experimental evidence suggests that exaggerated neural oscillations in the beta frequency (13-30 Hz) may be linked to the motor symptoms of Parkinson's disease (PD) and the GPe-STN network may play a central role in this process. Pathological strengthening of the inhibitory pallido-subthalamic synapses in the PD condition further exacerbates this abnormal activity which is caused by the triggering of plasticity mechanisms due to an imbalance between cortico-subthalamic and pallido-subthalamic inputs. Electrical deep brain stimulation (DBS) of the GPe or STN is a standard therapy for medically refractory PD, but its effectiveness may crucially depend on the spatio-temporal pattern of stimulation.

Methods : We investigated the effect of a time-shifted pattern of dual-site stimulation on pathologically strong GPe-STN synaptic connectivity modified by inhibitory spike-timing-dependent plasticity (STDP). To that end, we used a GPe-STN network model of conductance-based spiking neurons as a reduced model of the parkinsonian BG and separately stimulated the GPe and STN with a time shift (delay). We theoretically analysed the optimal range of the stimulation time shift and frequency for effective synaptic reorganization. These predictions were then tested computationally in a large network model.

Results : Our study showed that introducing a time shift between paired stimuli delivered to the GPe and STN can lead to inter-population synaptic reorganization through inhibitory STDP by

suppressing strong synaptic connections. Changes in the synaptic strengths ultimately led to desynchronizing after-effects within each population such that the power of abnormal beta oscillations was reduced in comparison to the control condition. These findings were critically dependent on the time shift between stimuli but were fairly robust to the continuous or intermittent delivery of simulation.

Conclusion : Our study suggests that STDP may shape the effects of electrical stimulation on brain activity and connectivity. These findings may contribute to the further development of a variety of multi-channel DBS protocols aiming at the remodeling of diseased brain networks through plasticity.

Keywords : Inhibitory spike-timing-dependent plasticity; synaptic reorganization; brain stimulation; abnormal beta oscillations; Parkinson's disease; basal ganglia

Count: 485
Abstract ID: 571
subject: Computational Neuroscience: Network Models
Presentation Type: Poster

Reducing demand uncertainty in the platelet supply chain through artificial neural networks and ARIMA models

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Background and Aim : One of the significant issues in global healthcare systems is improving the supply chain performance and addressing the uncertainties in demand. Blood products, especially platelets, have the most challenging supply chains in the health system given their short shelf life and limited human resources. Therefore, proper management of blood products is critical, and in turn, could reduce loss and health costs, and help preserve these valuable resources.

Methods : This study aims to predict blood platelet demands based on artificial neural networks (ANNs) and auto-regressive integrated moving average (ARIMA) models in order to reduce the uncertainty in the supply chain. To this end, daily demands for eight types of blood platelets from 2013 to 2018 were used in the current study. Data were collected from treatment centers and hospitals located in Zahedan, Iran.

Results : The results of this study indicated that ANNs and ARIMA models were more accurate in predicting the uncertainties in demand than the baseline model used in Zahedan Blood Transfusion Center. The highest and lowest prediction improvements based on ANNs and ARIMA models were associated with type O+ and A+ platelets, respectively.

Conclusion : Given that the ANN models can significantly improve the prediction of uncertainties in demand, we highly recommend that the conventional statistical prediction methods in blood transfusion centers be replaced with these models.

Keywords : Platelet supply chain, Demand forecast, Uncertainty, Artificial neural networks, ARIMA

Count: 486
Abstract ID: 614
subject: Computational Neuroscience: Computational Tools
Presentation Type: Oral

Brain age estimation of neonates based on structural MRI using Gaussian process regression

Submission Author: Seyedeh Masoumeh Taji

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Background and Aim : The neonatal brain undergoes significant neuroanatomical changes following birth, which can be effectively examined through structural magnetic resonance imaging (MRI). While recent studies have mainly focused on estimating brain age in adults using features derived from structural MRI, applying similar methodologies to neonates presents unique challenges that arise due to low tissue contrast, variable image quality, and the rapid evolution of brain structures in the weeks following birth. In this study, we introduce a voxel-based brain age estimation method based on Gaussian Process Regression (GPR), utilizing three-dimensional structural T2 MRI data in both preterm and term neonates.

Methods : We used T2-weighted MRI data from 885 term and preterm neonates aged 26-44 weeks postmenstrual. The data were sourced from the Developing Human Connectome Project (dHCP) database. Our pre-processing pipeline involved skull stripping and linear and nonlinear registration to the corresponding age-related template provided by dHCP, utilizing the FMRIB Software Library (FSL). Subsequently, the brain voxels from all neonates were well-arranged into a matrix, where rows represented subjects and columns represented voxel gray levels. To assess the model's performance, we employed a 10-fold cross-validation method to partition the data into training and test sets. In each fold, Principal Component Analysis (PCA) was applied to decompose the training data into 600 principal components (PCs), which were then utilized to estimate the

hyperparameters and covariance function parameters of the Gaussian Process Regression (GPR) model. The model's performance was evaluated using the test data transformed into the training set space using the PCs of the fold. Finally, the overall model performance was computed across the ten folds. The performance of the GPR model was compared to two commonly used regression methods: Support Vector Regression (SVR) and Relevance Vector Regression (RVR).

Results : The proposed brain age estimation method using the GPR model achieved a mean absolute error (MAE) of 0.447 (± 0.017, R2: 0.967) weeks. The MAE for the SVR and RVR models was 0.454 (± 0.025, R2: 0.963) and 0.476 (± 0.025, R2: 0.964) weeks, respectively.

Conclusion : Our results demonstrate the effectiveness of the proposed voxel-based method, combined with the GPR model, in estimating the brain age of neonates.

Keywords : Brain Age Estimation; Voxel-based method; Machine learning; Principal Component Analysis (PCA); Gaussian process regression (GPR)

Count: 487
Abstract ID: 188
subject: Computational Neuroscience: Computational Tools
Presentation Type: Oral

Online AI-Based Cognitive Assessment Platform for Comprehensive Cognitive Evaluation

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Background and Aim : The goal of this research paper is to introduce an online comprehensive AI-based cognitive assessment platform that utilizes mobile device cameras, eye tracking, and emotion recognition capabilities. The platform aims to provide a convenient and accessible means of assessing cognitive functions during various tasks, videos, and games. By leveraging artificial intelligence algorithms, the platform offers an in-depth analysis of cognitive performance while tracking eye movements and recognizing emotional responses. The integration of eye tracking and emotion recognition enhances the assessment process, enabling a more comprehensive understanding of attention, visual processing, emotional engagement, and overall cognitive abilities.

Methods : The method employed in this study involves data acquisition through an internet website, eliminating the need for any installation procedures. Users can easily access the platform through the website and grant camera permissions. The platform tracks users' gaze positions and measures their emotional arousal and valence during cognitive tasks, games, and videos. Emotion recognition is achieved through a CNN-based model, while landmark extraction and gaze tracking employ the widely adopted MediaPipe framework and a transformer-based technique, respectively. The platform also allows users to conveniently download key responses, gaze positions, and emotional changes for further analysis, enhancing the interpretability and utility of the cognitive assessments conducted through the platform.

Results : To evaluate the platform's effectiveness, an experimental evaluation was conducted. The experiment included a diverse range of stimuli in the Stroop test, incorporating emotional faces with varying degrees of valence and arousal. By capturing and analyzing users' emotional responses, landmark positions, and gaze-tracking data, the experiment assessed the platform's ability to accurately measure and interpret cognitive performance. The inclusion of 10 subjects ensured a sufficient sample size for robust analysis. The results demonstrated the platform's effectiveness in capturing and analyzing emotional responses, landmark positions, and gaze behavior during cognitive tasks, highlighting its potential as a valuable tool in research and clinical settings for comprehensive cognitive assessment.

Conclusion : The online comprehensive AI-based cognitive assessment platform utilizing mobile device cameras provides a convenient and accessible means of assessing cognitive functions. By incorporating eye tracking, emotion recognition, and advanced AI algorithms, the platform offers a comprehensive evaluation of cognitive performance during various tasks, videos, and games. The successful implementation of emotion recognition, landmark extraction, and gaze-tracking techniques further enhances the platform's capabilities. The results of the experiment demonstrate the platform's effectiveness in capturing and analyzing emotional responses, landmark positions, and gaze behavior during cognitive tasks. These findings highlight the platform's potential as a valuable tool in research and clinical settings, offering insights into cognitive processing and emotional engagement. The platform shows promise in enabling efficient and accurate cognitive assessments, paving the way for enhanced understanding and interventions in cognitive health.

Keywords : cognitive assessment, al-based platform, landmark positions, camera based gaze tracking

Count: 488
Abstract ID: 473
subject: Computational Neuroscience: Other
Presentation Type: Poster

Computational neurosciences: Where are we today?

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A correct and accurate understanding about the activity of the nervous system has always been an important concern for the scientists working this field, so that a significant number of studies can be found focusing on brain kinetics and dynamics. These efforts has resulted in expanding the field of knowledge called computational neurosciences in recent years which is going to be introduced more in this review. In fact, this branch of neurosciences discusses about the computational aspects of the brain physiology and pathology. In this regard, various models and equations have been developed, each of which mathematicalizes a part of central nervous system functions. As a result, we know much more about functioning of the brain today. Employing novel methods and techniques have resulted in better mapping of the brain, so that to date we would be able to predict the activity of the neurons and also the transmissions between them. In better words, the differences between the mentioned items in normal and abnormal conditions would be scrutinized under this branch of the neurosciences. It is important to note that, while concentrating on the quality, quantity is very important in computational neurosciences. Simply put, representing the events in the central nervous system through numbers would be one of the basic missions for the neuroscientists. To reach this goal, the notability of using the relevant software is undeniable. Therefore, an effective collaboration between the professionals in medical and engineering sciences would be very constructive. The outcome can be better understanding of the results obtained from in vivo and in vitro studies. On the other hand, optimization of preclinical and clinical studies would be another achievement in this field which would be so interesting for various groups of scientists including physiologists, pharmacologists, neurologists and psychiatrists. Altogether, the concluding remark can be the significance and the necessity of investing on this emerging scientific field which can bring many benefits for the health care settings in the near future.

Keywords : Computational Neurosciences; Brain; Central Nervous System; Mathematicalizing; Neurotransmission; Equations

Count: 489
Abstract ID: 387
subject: Neurorehabilitation and Regeneration: Psycho-cognitive Rehabilitation
Presentation Type: Oral

Transcranial Magnetic Stimulation for the Treatment of Depression and Psychiatric Disorders: Separating Hope from Hype

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Background and Aim : Transcranial Magnetic Stimulation (TMS) is a non-invasive procedure that employs magnetic fields to stimulate specific brain regions. While TMS has gained popularity as an alternative to traditional treatments like medication and therapy, it is crucial to assess the supporting evidence critically.

Methods : Our objective is to offer a comprehensive overview of the current state of TMS as a treatment option, distinguishing between exaggerated claims and substantiated evidence.

Results : We will explore various factors influencing treatment outcomes, including patient selection, treatment protocols, and long-term effectiveness. Furthermore, this abstract addresses the potential side effects and safety concerns associated with TMS, emphasizing the importance of proper administration and monitoring. Additionally, we will delve into the signaling pathways involved in the pathophysiology and treatment of depression, examining how TMS affects these pathways, genes, and intracellular elements.

Conclusion : Ultimately, this report aims to provide a balanced and critical assessment of TMS as a treatment option for depression and psychiatric disorders. By analyzing existing evidence, we hope to assist clinicians and patients in making well-informed decisions about incorporating TMS into their treatment plans.

Keywords : Transcranial Magnetic Stimulation, signaling pathways, pathophysiology, Depression.

Count: 490
Abstract ID: 315
subject: Neurorehabilitation and Regeneration: Physiotherapy
Presentation Type: Oral

Effect of sensorimotor training combined with transcranial direct current stimulation on cortical sensorimotor processing and clinical symptoms in patients with chronic low back pain

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Background and Aim : Despite the importance of brain changes in sensory and motor areas and impaired sensory-motor control of the back in people with low back pain, so far no study has been conducted to investigate the effect of combining transcranial electric current (tDCS) with sensory-motor exercises on brain processing and improving sensorimotor control. In this study, for the first time, the effect of anodal stimulation on the M1 and S1 region along with exercises will be measured on the improvement of the mentioned parameters. Therefore, the aim of this study is to find out the question whether stimulating M1 and S1 regions by anodal stimulation and combining it with exercises can be a more effective treatment or not. In this study, in addition to clinical parameters, the focus is also on neurophysiological parameters.

Methods : Experimental, randomized clinical trial Sensory-motor training group with real tDCS (N=14), sensory-motor training group with sham tDCS (N=14) Participants were randomly assigned to one of two groups. The participants in these groups attended the study for 12 sessions, 3 sessions a week and each session lasted 60 minutes. Sensory-motor exercises were performed in each group. In addition to the exercises, the transcranial electrical stimulation applied on the primary motor and sensory area with an intensity of 1.5 mA for 20 minutes. In sham stimulation, after the first 10 seconds, the current turned off. pain, disability, back motor control test, amplitude of sensory evoked potential (SEP) (N80 and N150), motor evoked potential (MEP) of the multifidus and transversus abdominis muscle, active motor threshold (AMT) of the multifidus and transversus abdominis muscle. The results were measured at two times: 1) before the start of the intervention (initial) and 2) after the completion of the treatment.

Results : In both groups, after the treatment compared to before, pain, disability and motor control test score were decreased (P<0.001). In both groups, the amplitude of the multifidus MEP was increased after treatment compared to before (0.019). In the intervention group, the AMT of the multifidus muscle was decreased at post than pre treatment (P=0.025), but it is not significant for the control group. Also, in the intervention group, the AMT of the transverse abdominal muscle was significantly reduced at post than pre treatment (P=0.044), but there was no difference in the control group. There is a significant negative relationship between changes in lumbar motor control and changes in N150 amplitude after treatment (P=0.017). Also, there is a positive significant relationship between the changes in motor control and the changes in the AMT of the multifidus muscle after treatment (P=0.033).

Conclusion : The result of this study showed that sensory-motor exercises can play a role in reducing pain and disability and improving motor control and increasing the excitability of the motor cortex to some extent, and the combination of these exercises with transcranial electrical stimulation, although the excitability of the motor cortex increases significantly, but does not have an advantage over the other group in improving clinical parameters.

Keywords : transcranial electrical stimulation, sensory-motor processing, sensory-motor exercises, chronic back pain

Count: 491
Abstract ID: 478
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Poster

Focusing on the locus of the breakdown for treatment of anomia: A pilot study

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Background and Aim : The primary goal of this study was to evaluate the treatment effects of semantic feature analysis (SFA) and phonological components analysis (PCA) on word retrieval processing in persons with aphasia (PWAs).

Methods : After identifying the locus of the breakdown in lexical retrieval processing, fifteen monolingual native Persian speakers with aphasia were divided into two groups. After three naming trials, participants with dominant semantic deficits received SFA, and participants with primary phonological deficits were provided with PCA three times a week for eight weeks.

Results : Both approaches improved participants' naming and performance on language tests, including spontaneous speech, repetition, comprehension, and semantic processing. However, the correct naming of treated and untreated items was higher in mild-to-moderate participants, with mostly circumlocution and semantic paraphasias in the SFA group. The same holds for mild-to-moderate participants with mostly phonemic paraphasia who received PCA therapy. Moreover, the results showed that participants' baseline naming performance and semantic abilities could be associated with the treatment outcomes.

Conclusion : Although limited by a lack of a control group, this study provided evidence supporting the possible benefits of focusing on the locus of the breakdown for treating anomia through SFA and PCA approaches, specifically in participants with mild to moderate aphasia. However, for those with severe aphasia, the treatment choice may not be as straightforward because several variables are likely to contribute to this population's word-finding difficulties. Replication with larger, well-stratified samples, use of a within-subjects alternating treatment design and consideration of treatments' long-term effects are required to better ascertain the effects of focusing on the locus of breakdown for treatment of anomia.

Keywords : Aphasia, anomia, paraphasia, semantic feature analysis (SFA), phonological component analysis (PCA)

Count: 492
Abstract ID: 601
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Breaking new ground: The quest for valid biomarkers in Mesenchymal Stem Cell therapy for neurodegenerative diseases, a comprehensive scoping review

Submission Author: Shahrzad Najafi

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Background and Aim : Neurodegenerative diseases, such as Amyotrophic Lateral Sclerosis (ALS), Parkinson's Disease (PD), and Ataxia, are a group of disorders characterized by the progressive loss of neurons in the brain and nervous system, resulting in a range of common symptoms and functional impairments. Recently, Mesenchymal Stem Cell (MSC)-based treatments have emerged as a promising approach for treating these conditions. However, the discovery of reliable biomarkers to assess the efficacy of MSC therapy is crucial in the field of regenerative medicine. Therefore, the current study aims to identify a valid biomarker for evaluating the response to MSC therapy in this area.

Methods : Using the PRISMA guideline, we systematically searched electronic databases (PubMed, SCOPUS, Cochrane, and Web of Science) in two complementary steps up to June 26, 2023, for reviews of clinical and experimental articles assessing all biomarkers in response to MSC therapy for the three disorders (ALS, PD, and Ataxia). We extracted relevant data from the included sources and presented a comprehensive summary of the results.

Results : Out of 2,663 initial review studies, a total of 50 articles were included in the study. Clinical parameters were found to be the most important biomarkers evaluated in all the studies, followed by paraclinical and immunological biomarkers, which were investigated in many studies. TNF-?, IL-1?, VEGF, GFAP, BDNF, GDNF. IGF-1, MCP-1 and INOS were among the most frequently investigated biomarkers in ALS, PD, and Ataxia, and were a common feature among the investigated biomarkers.

Conclusion : In summary, Scrutinizing the results of clinical studies in these 3 diseases shows that the most important and recurring biomarkers in response to cell therapy are clinical biomarkers. Most of them have shown definitive relative improvement in treated patients after MSC treatment, which can help clinicians and researchers in future studies. However, clinical studies with larger sample sizes will definitely provide more useful information in this field.

Keywords : ALS, Parkinson's disease, ataxia, Mesenchymal Stem Cells, diagnostic biomarkers

Count: 493
Abstract ID: 299
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Exploring the Therapeutic Potential of Human Hair Follicle Stem Cells in a Rat model of Alzheimer's Disease

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Background and Aim : Alzheimer's disease (AD) is a significant neurodegenerative condition. Present treatments solely aim to mitigate the symptoms of the disease without impeding its progression. An emerging approach for addressing Alzheimer's involves the exploration of cell therapy. The objective of this research was to investigate the therapeutic potential of human hair follicle stem cells (HFSCs) within an animal model mimicking Alzheimer's disease.

Methods : Male Sprague-Dawley adult rats, initially weighing between 250 and 350 grams, were assigned to one of three groups: a control group, an STZ (streptozotocin) group, and an STZ + HFSCs group. STZ was administered via microinjections, totaling 3 mg/kg, and divided into multiple doses delivered intracerebroventricularly on days 1 and 3 following canula implantation. In the case of the STZ + HFSCs group, two million HFSCs, suspended in 300 µl of phosphate-buffered saline, were intravenously injected into the rats' tail veins on days 4, 14, and 21 following the surgical procedures. To assess spatial memory function, a Y-maze test was conducted on day 28 post-surgery. After the completion of behavioral assessments, the animals were humanely euthanized, and their hippocampi were meticulously isolated for subsequent molecular analysis. The mRNA expression of key inflammatory genes, including IL1 (Interleukin-1), IL6 (Interleukin-6), IL10 (Interleukin-10), and TNF-alpha (Tumor Necrosis Factor-alpha), was evaluated.

Results : Our findings revealed that STZ administration resulted in impairment of spatial memory. However, cell therapy was unable to restore it. This study also investigated the gene expression of inflammatory markers following stem cell therapy in a rat model of Alzheimer's disease. When analyzing the expression of IL-1, there was no statistically significant difference between the STZ

group and the control group, whereas significant differences were observed between the stem cell-treated group and both the STZ and control groups. These findings were consistent with the patterns seen in the expression of both IL-6 and IL-10. Interestingly, TNF-alpha exhibited a distinct pattern. In all comparisons made, there were statistically significant differences in TNF-alpha expression. This suggests that TNF-alpha may be more consistently influenced by the experimental variables in the study, setting it apart from the other inflammatory markers.

Conclusion : These findings provide valuable insights into the intricate dynamics of inflammatory gene expression in the context of stem cell therapy within an Alzheimer's disease model, offering potential avenues for further research and therapeutic development.

Keywords : Cell Therapy; Memory impairment; Hair follicles; Alzheimer's Disease

Count: 494
Abstract ID: 434
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

Hydrogel-Encapsulated Exosomes for the Regeneration of spinal cord injury

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Spinal cord injury (SCI) is a critical neurological condition that may impair motor, sensory, and autonomous functions. At the cellular level, inflammation, impairment of axonal regeneration, and neuronal death are responsible for SCI-related complications. Regarding to the high mortality and morbidity rates associated with SCI, there is a need for effective treatment. Despite advances in SCI repair, an optimal treatment for complete recovery after SCI has not been found so far. Therefore, an effective strategy is needed to promote neuronal regeneration and repairing SCI. In recent years, regenerative treatments have become a potential option for achieving full functional recovery after SCI by promoting the growth of new neurons, protecting surviving neurons, and preventing additional damage to the spinal cord. Transplantation of cells and cells-derived EVs can be effective for SCI recovery. However, there are some limitations and challenges related to using cells and cells-derived EVs in the treatment of SCI. The combination of EVs and hydrogels could effectively promote neuroregeneration. This review aims to provide an overview of the current research status, challenges and future clinical opportunities of hydrogel-encapsulated cell-derived exosomes in the treatment of SCI.

Keywords : Spinal cord injury regeneration hydrogel-encapsulated cell-derived exosomes

Count: 495
Abstract ID: 161
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Unlocking the Therapeutic Potential: NSCs Exosomes in Stroke Recovery

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Background and Aim : Neural stem cells-derived Exosome (NSC-Ex) therapy for stroke is an experimental approach that involves using exosomes derived from neural stem cells to potentially promote recovery and repair after a stroke. Exosomes are small extracellular vesicles secreted by various cell types, including NSCs. They play a crucial role in intercellular communication by transferring bioactive molecules such as proteins, nucleic acids, and lipids between cells. Researchers have been exploring the therapeutic potential of exosomes in various diseases, including stroke. Studies have shown that NSC-derived exosomes can promote neuroprotection, angiogenesis, and tissue repair in animal models of ischemic stroke. NSC-Ex can exert neuroprotective effects in hypoxic-ischemic brain, as targeting miR-150-3p and its downstream gene CASP2 may represent potential therapeutic strategies for promoting neuronal cell proliferation and enhancing recovery in brain injury cases. An ischemic stroke model's therapeutic efficacy is enhanced by NSC-Ex stimulated by interferon gamma. However, by inhibiting DNA damage pathways, inducing growth/trophic factors, and exhibiting anti-inflammatory properties, NSCs-EX of TSG101-Overexpressing Human neural Stem Cells and F3SG cells can influence neuroprotection and functional recovery MCAO-induced brain damage. As well as exosomes can be used as a carrier for drug delivery through loaded plasma exosomes (EXO) with Edaravone, a known drug with neuroprotective effects and functionalizing the exosomal surface to improve the capability of stroke drugs to penetrate the BBB to improve the outcomes for stroke treatment.

Exosome-based therapies have a major impact on promoting angiogenesis and inflammation in stroke patients. The purpose of this review was to draw attention to the possible therapeutic application of exosomes in the regeneration of ischemic areas.

Methods : PubMed, Scopus, ISI Web of Science, EMBASE, and Google Scholar were searched for available articles on neural stem cells-derived exosome (up to March 2023). The research strategy was restricted to articles about NSC-Ex therapy for stroke in animal and human.

Results : Studies demonstrate the great potential benefits of NSC-Ex -based treatment for stroke, as well as the exosomes improved the therapeutic effects of NSCs on post-stroke brain lision and motor impairment through facilitating the recovery and repair processes in stroke patients.

Conclusion : Although preclinical studies have shown the potential advantages of NSC-Ex in the treatment of ischemic stroke, more analysis and clinical trials are required to confirm their effectiveness, safety and optimal delivery methods. Additionally, the specific mechanisms by which NSC-Ex exert their effects in stroke are still being investigated. Nonetheless, NSC-derived exosomes hold promise as a potential therapeutic approach for ischemic stroke and may pave the way for innovative treatments in the future. Exosome-based treatments have indeed demonstrated significant effects on promoting angiogenesis in the context of stroke.

Keywords : Exosome, stroke, miR-150-3p, CASP2, neuroprotective, angiogenesis

Count: 496
Abstract ID: 193
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Strengthening the therapeutic effect of neural stem cells on stroke: Focus on biomolecules

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Strokes continue to be a leading cause of mortality and disability globally and are the most frequent form of cerebrovascular disease. Approximately 80% of strokes are ischemic and multiple factors including neuroinflammatory responses, energy failure, lack of homeostasis, local scar formation, promotion of intracellular calcium levels, excitotoxicity, free radical-mediated toxicity, and BBB disintegrity play the main role in stroke development. The most promising treatment approach for ischemic stroke is thought to be stem cell therapy, which can significantly increase the therapeutic window. In particular, neural stem cells (NSCs) can promote the recovery of neurological function in stroke patients by protecting the blood–brain barrier, reducing the inflammatory response, and promoting neurogenesis and angiogenesis. NSCs are highly migratory and seem to be attracted to injured brain areas such as ischemic regions. Also they express a wide variety of receptors that may enable them to respond to many chemotactic signals that emanate from brain pathologie. on the other hand, Compounds that enhance endogenous neuroregenerative capacity following a stroke, such as by eliciting compensatory neurogenic mechanisms in the subventricular zone (SVZ) and subgranular zone (SGZ), are used in non-cell-based therapy. Since transplant of neural stem cells solely is not sufficient. These signaling molecules per se promote dynamic cell growth within the neurogenic areas, support the migration of neuroblasts, and stimulate pro-angiogenesis signaling pathways in peri-ischemic zones. So in neurodegenerative diseases, whether the neural stem cells were coupled with neurotrophic factors, such as brain-derived neurotrophic factor (BDNF), Glial cell line-derived neurotrophic factor (GDNF), vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF), and epidermal growth factor (EGF), in this case, the regenerative capacity improves to a high level. This combination therapeutic approach may increase results by the stimulation of endogenous neurogenesis, anti-inflammatory, neuroprotective properties, and enhancement of stem cell survival rates and ultimately may be more effective than stem cell therapy alone.

Keywords : Neural Stem Cells, Neuroregeneration, stroke, Combination therapies, Biomolecules

Count: 497
Abstract ID: 321
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

NEW ALTERNATIVE IN CELL THERAPY USING ALLOGENEIC/HETEROLOGOUS SPERM HEAD TO REPAIR AND REGENERATE BRAIN IN ANIMAL MODEL OF ALZHEIMER'S DISEASE: GUIDANCES FROM REPRODUCTIVE IMMUNOLOGY

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Background and Aim : Alzheimer's disease (AD) is associated with accumulation of amyloid-β (Aβ) and inflammatory microglia and astrocytes. These phenomenon along with abnormal lymphatics associated with insufficient clearance of Aβ and other toxicants from brain establish a chronic inflammation. In addition, abnormal choroid plexus, leukocyte trafficking, and hypoxic condition are observed. Reproductive immunology has revealed that sperm induces constructive inflammatory response leading to uterus remodeling and making it into its best microenvironment. Our previous studies revealed therapeutic efficacy of allogeneic sperm head in animal model of AD. In this study, we evaluated therapeutic efficacy of heterologous sperm in AD animal model.

Methods : To do so, rat model of AD was induced by intra-hippocampal injection of Aβ. A pool of allogeneic or heterologous sperm head was prepared. Sperm head was administered via nasal route to AD model. Bahavioral and molecular examinations were made to compare treatment groups with control AD model. On this basis, Morris water maze test was done to evaluate learning memory. Neural growth factors, choroid plexus function, gliosis, and hypoxia was evaluated using immunohistochemistry. Lymphatics was evaluated using immunohistochemistry and real-time PCR.

Results : Results demonstrates that heterologous sperm head had similar therapeutic efficacy modulating learning memory. Aβ level, as well as lymphatics, represented by CD31, CCL21, and PPDPN, and LYVE-1, were significantly modulated. Neural growth factors, represented by BDNF and NGF, choroid plexus function, represented by ICAM-1, VCAM-1, and CXCL10, gliosis,

represented by GFAP and Iba-1, and hypoxic condition represented by HIF-a, were profoundly improved.

Conclusion : Immunologic properties of allogeneic/heterologous sperm head to elicit constructive inflammation can be extended to other organs. This approach is nature-based expected to be safe or with least side effects. Cell therapy using allogeneic/heterologous sperm head overcomes genetic difference as an important obstacle and limitation in cell therapy.

Keywords : Alzheimer's, sperm, brain-structure/function, repair/regeneration, cell-therapy, allogeneic, heterologous, lymphatics, choroid-plexus, gliosis, hypoxia

Count: 498
Abstract ID: 137
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

Anti-tumoral effects of Riluzole in comparison with Temozolomide on Glioblastoma and Spinal Cord Tumor stem cells derived from patients

Submission Author: Maedeh AmiriShahri

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Background and Aim : Glioblastoma multiforme (GBM) and spinal cord tumors are tumors with high recurrence rate. Recent studies suggest Riluzole has anti-tumoral effects. We evaluated the efficacy of combination therapy with Riluzole and temozolomide (TMZ) on glioblastoma stem-like cells (GSCs) and spinal cord tumor stem cells (SCTSCs) in vitro.

Methods : cells were extracted from two patients with spinal cord tumors and three patients with GBM. We evaluated the effects of combinatorial and monotherapy with Riluzole and TMZ on cultured stem cells. The MTS, the CytoTox-Fluor™ Cytotoxicity, and the Caspase-Glo® 3/7 assay were used to assess the cell viability, the protease activity of the dead cells, and the early apoptosis, respectively.

Results : The study enrolled two men with spinal cord tumors and a man and two women with GBM. We found no notable differences between the combination therapy and monodrug therapy of GSCs and SCTSCs in the case of cell viability. But cell apoptosis of GSCs and SCTSCs resulted significantly after 24h treatment with the monodrug and combinatorial therapies ($P < 0.05$). However it turned to non-significant in GSCs after 48h. The cytotoxicity of GSCs was significant after 24h of combination therapy ($P < 0.05$), while the cytotoxicity of the SCTSCs turned to significant after 48h in both therapies ($P < 0.05$).

Conclusion : These data suggest that combinatorial therapy with Riluzole and TMZ might indicate better anti-tumoral effects on GSCs and SCTSCs than monodrug therapy.

Keywords : Riluzole; Glioblastoma; Spinal cord tumor; Temozolomide; Combinational therapy

Count: 499
Abstract ID: 150
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

The effects of hypoxic preconditioning on survival and oxidative stress resilience of SH-SY5Y cell line

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Background and Aim : Parkinson's disease (PD) is a chronic neurological disorder characterized by both motor and non-motor symptoms. It affects approximately 1-2% of individuals aged over 65, making it the second most common age-related neurological disorder after Alzheimer's disease. One of its defining features is the progressive loss of dopamine neurons in the substantia nigra of the midbrain. Motor and non-motor symptoms significantly reduce patients' quality of life. SH-SY5Y cell lines are commonly used in neurological research due to their neuron-like properties, including morphological characteristics resembling adrenergic neurons and the expression of dopaminergic neuron markers. Recent studies have revealed that hypoxic conditions can enhance cell survival and the expression of neural factors, which promotes neurotrophic effects. Therefore, this study investigated the impact of hypoxic preconditioning on the survival and oxidative stress tolerance of SH-SY5Y cells.

Methods : In our study, we compared the cultivation of SH-SY5Y cells under hypoxic conditions in vitro and their survival in such conditions, as well as their response to oxidative stress induced by H2O2, in contrast to cells cultured under normal conditions. SH-SY5Y cells were subjected to 24, 48, and 72 hours of hypoxic conditions. Live and dead cells were distinguished using triple staining with fluorescein diacetate, propidium iodide, and Hoechst 33342. Propidium iodide served as an indicator for both necrotic and late apoptotic cells, fluorescein diacetate was utilized to identify vital, living cells, and Hoechst 33342 was employed for nuclei staining. Oxidative stress was induced by exposing SH-SY5Y cells to hydrogen peroxide (H2O2) for 24 hours at concentrations ranging from 200 to 2000 micromolar, which were diluted in a complete medium. Cell viability was assessed using the MTT assay.

Results : A 3-day exposure to hypoxia resulted in the death of nearly all SH-SY5Y cells. Although the number of live SH-SY5Y cells was higher following a 2-day exposure to hypoxia, more than half of these cells succumbed to cell death. However, no evidence of cell death was observed after just 1 day of hypoxia. Consequently, we selected a 24-hour hypoxic preconditioning period for SH-SY5Y cells based on these findings. The outcomes of our study demonstrated that hypoxic preconditioning exhibited a protective effect in SH-SY5Y cells when exposed to 1200 micromolar H2O2.

Conclusion : Hypoxic preconditioning enhances the survival and oxidative stress resilience of SH-SY5Y cells, offering potential benefits for central nervous system cell therapy. These findings underscore the importance of hypoxic preconditioning and warrant further research into the underlying mechanisms, bringing us closer to effective neurological disorder treatments.

Keywords : Hypoxic preconditioning; Cell therapy; SH-SY5Y

Count: 500
Abstract ID: 527
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Neuroprotective effects of stem cells in Alzheimer's disease: role of miRNAs

Submission Author: Haniyeh Kariminejad-Farsangi

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Background and Aim : -Globally, neurological diseases pose a major burden to healthcare professionals in terms of the management and prevention of the disorder. Among neurological diseases, Alzheimer's disease (AD) accounts for 50%–70% of dementia and is the fifth leading cause of mortality worldwide. AD is a progressive, degenerative neurological disease, with the loss of neurons and synapses in the cerebral cortex and subcortical regions. Although a few drugs can provide temporary and partial relief of symptoms in some patients, no curative treatment is available. Therefore, attention has been focused on research using stem cells to treat AD. Stem cells can induce direct regeneration of neurons and synapses. They can also prevent activation of pro-inflammatory microglia, promote activation of anti-inflammatory microglia, inhibit astrogliosis, and promote nonreactive astrocytes. Moreover, evidence suggests that MicroRNAs (miRNAs) are the main effectors by which they exert neuroprotective effects. miRNAs are small non-coding RNA molecules, which bind to the 3'UTR of target mRNA and regulate gene expression by suppressing their translation. In this review, we aimed to explore the role of miRNAs in the field of stem cell therapy as promising neuroprotective agents in AD.

Methods : -The keywords ("Alzheimer's") AND ("stem cell") AND (microrna OR miRNA OR miR) were searched in the electronic databases, including PubMed, Web of Science, and google scholar. Resultant articles were gathered and used for writing.

Results : -Studies have shown that stem cells by transferring exosomes containing miRNAs such as miR-29b, miR-146, miR-22 affect neuroinflammation, neurogenesis and apoptosis of neurons. Also, stem cells can exert their neuroprotective effects by altering target cell miRNAs and ultimately lead to the improvement of cognitive impairment in AD.

Conclusion : Stem cells exert their neuroprotective effect through the transfer of their own miRNAs as well as changes in the miRNAs of target cells. Accordingly, considering the role of miRNAs, stem cell could be as a significant neuroprotective factor in combating AD.

Keywords : Alzheimer's disease, stem cells, miRNAs

Count: 501
Abstract ID: 227
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

ZFP521 Prolonged Expression Partially Relaunch the Generic Neuronal Genes in U87-MG Glioblastoma Cells: A Primitive Study

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Background and Aim : Background: Cell identity manipulation is a growing strategy for glial scar and astrocytoma in situ modifications toward neurons. Among all impactful transcription factors, ZFP521 has been reported to be capable of neurogenesis induction in adult astrocytes and glial scar cells. Objectives: Herein, we aim to explore the same transcription factor prolong effect on the gene expression pattern of U87-MG, the most aberrant glioblastoma cell line.

Methods : Materials and Method: The U87-MG cells were transfected by Zfp521-IRES-GFP and maintained in neural inductive medium for over 3 weeks. Then, the relative quantitative expression level of PAX6, TUB3, OLIG2, SOX1, GFAP, ITGA6 and NES were examined. Then we transplanted the transfected cells to spinal cord injury animal models, in order to address the function of modified cells.

Results : Results: Our results demonstrated that the excessive expression of ZFP521 caused significant enhancement in PAX6, TUB3 and, OLIG2 gene expression while substantially decreasing the SOX1 level. The GFAP, ITGA6 and NES expression levels remained unchanged. After cell transplantation, the U87-ZFP521 animals displayed a remarkable increase in their

coordinate movement, weight support, and movements, compared with U87-GFP and the control animals. Moreover, a couple of gaiting parameters, such as step length, step width, and toe spread were enhanced in U87-ZFP521, during a five-week treatment.

Conclusion : Conclusions: According to our findings, controlling ZFP521 expression level prominently enables the neuronal and oligodendrocyte lineage alley in the glioblastoma cell line.

Keywords : Spinal cord injury; Glioblastoma; Cell lines; Cancer stem cells; Gene over-expression; Human astrocytoma cells

Count: 502
Abstract ID: 175
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

Synergetic effect of conductive conduit and electrical stimulation for peripheral nerve regeneration applications

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Background and Aim : This research aims to investigate the synergistic effect of using a conductive nerve conduit and electrical stimulation (ES) to improve sciatic nerve regeneration and functional recovery.

Methods : Conductive conduits were fabricated by incorporating gold nanoparticles (AuNPs) within silk fibroin (SF) films and filling them with collagen hydrogel containing adipose-derive stem cells (ADSCs). The average diameter and distribution of the AuNPs were determined using TEM, and the crystalline structure of the films, hydrogel porosity, and biocompatibility were evaluated through XRD, SEM, and MTT assays, respectively. The efficacy of the therapies was investigated in 5 animal groups using Wistar rats: animals treated with 1) sciatic nerve autograft, 2) non-conductive conduits, 3) conductive conduits, 4) non-conductive conduits and ES, and 5) conductive conduits and ES. A 12 mm segment of the right sciatic nerve was transected. ES was delivered with a frequency of 20 Hz, pulse duration of 0.1 ms, and voltage of 1.2 V for 30 minutes. The local tissue response was evaluated by observing inflammation, necrosis, edema, and congestion after 2 and 6 weeks post-surgery. Histological evaluations were performed using H&E staining and immunostaining against FN200 and S100. Myelin visualization was facilitated by

luxol fast blue staining. Ultrastructural evaluation of tissues in different treatment groups was analyzed using TEM microscopy, and functional recovery was assessed by the SFI test.

Results : The TEM images showed that AuNPs were evenly distributed within the SF films, with an average diameter of 16±2.5 nm. XRD spectrum confirmed the presence of β-sheet structures in the SF films. The SF/AuNPs films exhibited electronic conduction with a conductivity of 7.24×10-3 (S/cm). MTT assay indicated that cellular metabolism was significantly higher on collagen and SF/AuNPs films compared to tissue culture plate. After two weeks, minimal edema was observed due to surgery, which resolved over time. Mild to moderate congestion was present in non-stimulated groups but absent in others. Fibroplasia was observed in injured nerves during the late phase, except in non-conductive non-stimulated groups. The scaffolds maintained their structural integrity and allowed cellular colonization, which increased over six weeks. Two weeks after surgery, non-electrically stimulated group showed disrupted sciatic nerve fibers, axonal swelling, and myelin fragmentation, indicating Wallerian degeneration. In contrast, the conductive group with ES primarily exhibited axonal swelling and limited signs of neural degeneration. At six weeks, non-conductive scaffolds showed ongoing Wallerian degeneration, while conductive scaffolds showed minimal nerve degeneration and sporadic axon sprouting, indicating nerve regeneration. Treatment with conductive scaffolds and ES resulted in a higher count of myelinated nerve fibers comparable to the autograft group. Other groups demonstrated a decrease in the number of myelinated axons compared to the autograft. Additionally, the electrically stimulated group at six weeks had significantly higher SFI scores compared to groups 1, 2, and 3, while comparisons between other groups were insignificant.

Conclusion : In our study, we found that ES combined with a conductive conduit based on silk and AuNPs led to better neural tissue regeneration and improved functional recovery compared to groups without ES in a rat model of sciatic nerve injury.

Keywords : Nerve regeneration; Conductive conduit; Electrical stimulation; Silk; Gold nanoparticles

Count: 503
Abstract ID: 100
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Oral

Construction of neural conduit with piezoelectric property with injectable gel of gellan containing alginate and curcumin with the aim of repairing nerve tissue

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Background and Aim : A neural conduit with piezoelectric behavior and the potential of drug delivery would provide the desired microenvironment for peripheral nerve regeneration. Piezoelectric structures with self-electrical are preferred structures to manage electrical demands and drug release at the target zone in the case of nerve tissue engineering and their ability to promote neural growth was assessed in vivo.

Methods : Bi-layered core-shell neural conduit with the piezoelectric behavior was synthesized using electrospinning of chitosan-gelatin- PLLA nanofibers incorporated with PAG nanocomposites in the outer layer, PCL electrospun mat containing BaTiO3 nanoparticles in the inner layer. In situ, gel (gellan) was injected into the core structure containing curcumin loaded in sodium alginate nanoparticles with the pre-gelation method. SEM, FTIR, XRD, DLS, piezoelectric, swelling, gelation time, drug release, and on the other hand histological evaluation, and Sciatic function index (SFI) were assessed.

Results : PCL nanofibers containing (BaTiO3) and PLLA nanofibers incorporated with PAG nanocomposites showed smooth fibers without any specific beads. SEM analysis shows the proper fiber distribution. XRD spectra indicate the increased crystalline phase compared to the pure one. Synthesized nanofibers indicate piezoelectric properties and Alginate nanoparticles in SEM and DLS test with spherical morphology and average particle size of 80 nm were observed. In the drug delivery aspect, a curcumin release profile of 3 days in the dialysis bag 7 days in the case of

nanoparticles loading in the gel, and 12 days in the complete core-shell conduit was detected. In the histological situation, the results showed an increase in the formation of the perineurium and epineurium, the leukocyte infiltration completely disappeared axon swelling was decreased, and increased the number of axons at the end, The amount of fibrosis decreased after placing the core-shell conduit.

Conclusion : Our obtained results illustrate that core-shell conduit filled with gellan-containing curcumin-loaded sodium alginate nanoparticles provides a suitable substrate for peripheral nerve regeneration.

Keywords : Piezoelectric property; Tissue Engineering; Nanofibers; Gellan; Conduit. Nerve regeneration

Count: 504
Abstract ID: 257
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Oral

The effect of combined tDCS and VR training on fatigue, balance and walking in patients with multiple sclerosis

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Background and Aim : Objective: Fatigue, imbalance and walking disorder are common and debilitating symptoms in patients with multiple sclerosis (MS). The present study was designed to investigate transcranial direct current stimulation (tDCS) and virtual reality (VR) training on fatigue, balance and walking in patients with MS separately and in combinition

Methods : Methods: The participants include 30 patients with MS in aged 18-55 years (21 female and 9 male) which were randomly divided into one of three groups: tDCS group, VR training group and combined tDCS-VR training group. Fatigue Severity Scale, Berg balance test and 25-foot walk test were used to evaluate fatigue, balance and walking speed respectively as pre and post- tests.

Results : Results: Our findings showed a significant effect of tDCS, VR and tDCS-VR on fatigue and a significant effect of VR and tDCS-VR on the balance and walking speed in patients with MS($p<0.05$). In comparing between different interventions effect on fatigue and balance and walking speed although, the VR and tDCS-VR groups were significantly better than the tDCS group ($p<0.05$); but there was not significant difference between VR and tDCS-VR groups ($p>0.05$).

Conclusion : Conclusion: Despite the positive findings in the effectiveness of virtual reality and brain stimulation interventions on fatigue, balance and walking in MS patients, combination effect of tDCS with VR therapy, should be investigated further.

Keywords : multiple sclerosis, transcranial direct current stimulation (tDCS), virtual reality (VR)

Count: 505
Abstract ID: 385
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

The Effect of a drawing-based training package on visuo-perceptual organization skills in primary school children

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Background and Aim : The ability to integrate local elements into a meaningful global whole is called as visuo-perceptual organization which is a fundamental cognitive ability in children. Therefore, any delay in the development of this ability has a negative impact on information manipulation, learning (e.g., mathematics and reading), and problem-solving. As a result, in recent years, studies have focused on developing strategies that could enhance visuo-perceptual organization in children. In this context, the aim of this study was to develop a training package for the enhancement of visuo-perceptual organization and visual-spatial abilities in primary school children. Previous studies have shown that drawing-based training had promising outcomes in improving in groups of adults, teenagers, and preschool children. However, no study has been conducted in the group of primary school students, especially in the first years of formal education. Therefore, the purpose of this study was to investigate whether drawing-based training improves the ability of visual perception in primary school children.

Methods : The participants included 44 children (females = 24) aged 6 to 9 years. They were randomly divided into experimental and control groups. Each group comprised of 22 children (females = 12). Each group first completed the block design test which could assess the ability of perceptual organization during the pre-test, and then the experimental group received the training package for one session (90 min). Our training strategy was inspired by available rehabilitation packages used for individuals with perceptual problems. In our training procedure, the children were taught how to draw a complex shape in a step-by-step procedure. After two weeks, in the post-test, both groups completed the block design test again.

Results : Our results showed that there was a significant improvement in the score of the experimental group in the block design test after receiving the drawing-based training package (with a step-by-step approach) compared to the control group ($p<0.001$).

Conclusion : The drawing-based training package (with a step-by-step approach) can improve visuo-perceptual organizational skills in primary school children.

Keywords : Children; Drawing-based training; Global-local processing; Visuo-perceptual organization

Count: 506
Abstract ID: 263
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

The Efficacy of Robotic-Assisted Gait Training in Lower Extremity Strength and Gait Parameters of Patients with Spinal Cord Injuries; a Systematic Review and Meta-Analysis

Submission Author: Amirmohammad Toloui

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Background and Aim : Restoring mobility and the extremities' muscle force is fundamental to the recovery process of spinal cord injuries (SCI). Robotic-assisted gait training (RAGT) has emerged as a promising new rehabilitation approach in SCI patients with limited physical activity, allowing repetitive and task-specific training. This systematic review and meta-analysis aimed to evaluate the efficacy of this approach in lower extremity strength and gait parameters in SCI patients.

Methods : A systematic search was conducted in Medline, Embase, Scopus, and Web of Science by the end of July 2023 for randomized controlled trials (RCT). Two independent researchers performed the screening process and selected the articles that met our inclusion criteria. Data were extracted into a data sheet designed based on the PRISMA guidelines. The mean change and combined standard deviations were calculated for both the intervention and control groups. A standardized mean difference (SMD) with a 95% confidence interval (95%CI) was calculated for

each sample, and an overall pooled effect size was reported for each outcome. The I2 and Chi2 tests were utilized to assess heterogeneity. The certainty of evidence was evaluated based on the GRADE framework.

Results : Fifteen articles met our inclusion criteria. The pooled data analysis with a high level of evidence showed that SCI patients undergoing RAGT demonstrated improvement in walking independence post-intervention (SMD = 0.31; 95%CI: 0.01 to 0.6; p = 0.04; I2 = 0%). However, this approach had no significant impact on the gait speed of SCI patients, both in the self-selected velocity (SMD = 0.2; 95%CI: -0.13 to 0.54; p = 0.19; I2 = 0%) and maximal speed (SMD = 0.02; 95%CI: -0.37 to 0.41; p = 0.88; I2 = 0%). Similarly, no improvement was observed in gait endurance (SMD = 0.23; 95%CI: -0.18 to 0.63; p = 0.21; I2 = 0%), and the lower extremity muscle strength (SMD = 0.17; 95%CI: -0.09 to 0.44; p = 0.17; I2 = 0%).

Conclusion : We found that RAGT does not improve gait speed, endurance, and lower extremity muscle strength in SCI patients. In light of the high costs of RAGT and the intensity of the intervention, it is essential to take these results into consideration to possibly modify the approach, intervention, follow-up intervals, and sample size for future RCTs.

Keywords : Spinal cord injury; robotic-assisted gait training; gait parameters

Count: 507
Abstract ID: 641
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

The difference between the old and new models of Craig Scott's orthosis

Submission Author: Ladan Arabyaqoubi

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Background and Aim : -Spinal cord injury or damage to the spine causes disturbance in movement and movement and sensation, which can cause partial or complete paralysis, which is a therapeutic method of using orthosis to return some abilities in the patient, one of these orthoses is Craig-Scott. Compared to his previous orthoses, a 3-point pressure system with fewer bands was used.

Methods : -Search in SCIENCE-PUBMED-ELSEVIER database

Results : -According to the articles, the main problem in the use of orthoses is their high energy consumption, and the use of this orthoses requires little energy consumption compared to its previous models, and in terms of beauty and independence in the patient and creating confidence, it is acceptable and compared to RGO, the energy cost is lower in the model. It creates a swing-through movement and this orthosis has more energy efficiency than the single leg brace in terms of energy efficiency, and instead of this orthosis it creates significant stiffness in the wrist joint, it increases the efficiency of the patient in addition to reducing energy consumption and reduces anatomic knee shear. And because the number of bandages has decreased, the time of putting on and taking off has decreased.

Conclusion : Studies show that most of the spinal cord injury patients with Craig Scott orthosis can walk and stand, and the effect of reducing the energy consumption of the lower thoracic injury is more than the upper thoracic, and the patients have been successful with this gait orthosis. A series of basic needs must arise in every walking system in order for the use of orthosis to have significant satisfaction. Because the lack of movement in these patients has caused fractures, osteoporosis, and spasticity, warts must be designed according to the mental and physical conditions and life of the patient so that it is possible for the patient. Be patient.

Keywords : Craig Scott KAFO

Count: 508
Abstract ID: 480
subject: Neurorehabilitation and Regeneration: Cognitive Rehabilitation
Presentation Type: Poster

Mechanisms of brain activation following naming therapy in aphasia: A systematic review on task-based fMRI studies

Submission Author: Ehsan Shekari

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Background and Aim : -The pattern of brain neuroplasticity after naming therapies in patients with aphasia can be evaluated using task-based fMRI. This article aims to review studies investigating brain reorganization after semantic and phonological-based anomia therapy that used picture-naming fMRI tasks.

Methods : -We searched for those articles that compared the activation of brain areas before and after aphasia therapies in the PubMed and the EMBASE databases from 1993 up to April 2020. All studies (single cases or group designs) on anomia treatment in individuals with acquired aphasia were reviewed. Data were synthesized descriptively through tables to allow the facilitated comparison of the studies.

Results : -A total of 14 studies were selected and reviewed. The results of the reviewed studies demonstrated that the naming improvement is associated with changes in the activation of cortical and subcortical brain areas.

Conclusion : This review highlights the need for a more systematic investigation of the association between decreased and increased activation of brain areas related to anomia therapy. Also, more detailed information about factors influencing brain reorganization is required to elucidate the neural mechanisms of anomia therapy. Overall, regarding the theoretical and clinical aspects, the number of studies that used intensive protocol is growing, and based on the positive potential of these treatments, they could be suitable for the rehabilitation of people with aphasia.

Keywords : Anomia therapy, brain reorganization, neuroplasticity, phonological-based treatments, picture naming fMRI task, semantic-based treatments

Count: 509
Abstract ID: 662
subject: Neurorehabilitation and Regeneration: Cognitive Rehabilitation
Presentation Type: Poster

An overview of hyperbaric oxygen therapy in basic and clinical neuroscience

Submission Author: Ahmad Ebadi

Ahmad Ebadi [1]

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Background and Aim : Hyperbaric oxygen treatment (HBOT) the medical use of oxygen at environmental pressure greater than one atmosphere absolute in monoplace or multiplace chamber is a very effective therapy for several approved clinical situations, such as carbon monoxide intoxication, incurable diabetes or radiation-injury wounds, and smoke inhalation as International indications. In recent years, it has also been used to improve cognition, neurowellness, and quality of life following brain trauma and stroke. This treatment is used to accelerate tissue recovery and improve its physiological aspects and clinical features, by providing an increased supply of oxygen to the damaged tissue. In this review, we discuss the consequences of HBOT in molecular and clinical issues in patients exposed to HBOT.

Methods : We studied books and articles in HBOT mechanisms and effects on basic and clinical neuroscience in 2019-2023 in some medial databases.

Results : -In this research review we have studies that propose HBOT on mitochondrial properties, alterations in white matter, neuroinflammation, Immunosuppression and immunopreparation, oxidative stress, neuroprotection, antioxidant and antiapoptotic activities, angiogenesis and changes in cerebral blood flow, preservation of blood-brain barrier, brain edema minimization, autism spectrum disorder (ASD) , cerebral palsy (CP) , acute and chronic traumatic brain injuries (TBI) and spinal cord injuries, Alzheimer and vascular dementia, preconditioning of the brain and endogenous and transplant stem cell populations and stem cell priming. Indeed we have a spectrum of molecular effects in mitochondria to degrees of clinical improvement in ASD,CP and TBI by HBOT.

Conclusion : We due to the many effects of HBOT in neuronal processes and brain functions offer usage of this cellular rehabilitation therapy in clinics and hospitals with educational, research and therapeutic approaches.

Keywords : HBOT; basic neuroscience ; clinical neuroscience ; neurocognition ; neurorehabilitation

Count: 510
Abstract ID: 42
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Oral

Enhancement of conformity behavior with the application of a non-invasive brain stimulation technique

Submission Author: Farzaneh AbdollahzadehBina

Farzaneh Abdollahzadeh Bina[1], Hassan Sabouri Moghaddam[2], Abbas Bakhshipour Roudsari[3]

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Background and Aim : The primary objective of this research was to assess and compare the efficacy of transcranial direct current stimulation on informational social conformity in individuals of both genders having internal/external Locus of control.

Methods : The methodology employed in this study involved selecting a statistical population consisting of male and female students from the University of Tabriz. Forty-eight individuals were divided equally into four groups based on their gender and locus of control (LOC) orientation, specifically males with external LOC/internal LOC and females with internal LOC/external LOC. The participants were chosen using a non-random and available sampling method. The current study employed a quasi-experimental design, including pre-test and post-test assessments. During the pre-test phase, the computerized Conformity task was administered. Subsequently, two transcranial direct current stimulation sessions were applied to target the brain's ventromedial prefrontal cortex (vmPFC) region. During the post-test phase, the Conformity task was repeated. The data analysis involved covariance analysis and the least significant difference (LSD) test in the SPSS software.

Results : Following the application of transcranial direct current stimulation, there was an observed rise in the level of social-informational conformity among all groups. Specifically, transcranial direct current stimulation demonstrates greater efficacy in males with an external LOC than in males with an internal LOC.

Conclusion : tDCS has improved informational social conformity in males with external/internal LOC and women with internal/external LOC. Moreover, stimulating the vmPFC has substantially

impacted the inclination towards informational social conformity in both women and men. This effect is particularly pronounced when individuals initially hold an opposing opinion from the majority.

Keywords : Transcranial direct current stimulation; Informational social conformity; Ventromedial prefrontal cortex; Locus of Control; Gender

Count: 511
Abstract ID: 93
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Oral

Social Cognitive Study of Inter-religious Prejudices and Stereotypes Among Kurd, Balochi, Turkmen University Students in Iran

Submission Author: Sobhan Rezaee

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Background and Aim : Border settlement is the social platform for the coexistence of various ethnicities and religions in Kurdistan, Sistan & Baluchistan, and Turkmen Sahra in Iran. But this platform, like many similar social contexts, is sensitive to inter-ethnic and inter-religious prejudices and cognitive representation of self and others. The current study aims to answer these three questions: (1) What kind of inter-religious prejudices and streotypes exist in Sunni students living in Kurdistan, Sistan & Baluchistan, and Turkmen Sahra or migrated to Tehran? (2) What is the level of inter-religious prejudices among Sunni and Shia students living in the mentioned cities? (3) What is the effect of educational migration to Tehran on the type and level of inter-religious prejudices in Sunni students?

Methods : This is a mixed-method study using qualitative and quantitative tools. The Stereotype Content Model of Suzan Fiske was used for quantitative assessment. Also, in order to gain a deeper understanding of the cognitive representation of self and other in inter-religious relations among Sunni students, we asked the participants to describe themselves and the Shiites of their provinces using at least five traits.

Results : Based on the survey data, in kurdish and Turkman students, migration to Tehran caused a decline in representation of the aboriginal shiite others and the self (based on the views of shiite people). Among Balochi students, who had the worst image of self and aborignal shiite others compared to Turkmen and Kurdish counterparts, migration to Tehran improved the situation, including improving the indicators of warmness and competency, which could transit this inter-religious prejudice from disgust to pride.

Conclusion : Prejudice greatly affects the relationship of Sunni people living in Kurdistan, Sistan & Baluchistan, and Turkmen Sahra with Shia residents. Educational migration to Tehran negatively affects the image of Shiite others among Kurdish and Turkmen people, while inter-religious communication are slightly improved among Baluchies after migration.

Keywords : Social Cognition, Prejudice, inter-cultural communication, Iran, educational migration

Count: 512
Abstract ID: 579
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Poster

How Difficulties in Emotion Processing Impact Emotional Learning

Submission Author: Mina Hosseinnezhad

Mina Hosseinnezhad[1], Mohammad Reza Bigham[2], Soroosh Golbabaei[3], Khatereh Borhani[4]

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Background and Aim : Emotions play a crucial role in our social lives. As intelligent social creatures, We rely on the emotional expressions of others (verbal or facial cues) to make inferences about their internal states, react to their emotions, and adapt our responses by receiving feedback from them. However, in complex social interactions, these emotional cues contradict each other. Thus, difficulty in emotion processing and emotion discrimination, as is seen in alexithymia personality traits, may affect disentangling conflicting emotional cues. In this study, we explored whether difficulties in emotion processing affect learning from the socio-emotional feedback

Methods : To this end, sixty participants (Mage= 23.75, SD = 3.89; 32 females) with low and high levels of alexithymia, assessed by the Toronto Alexithymia Scale (TAS-20), took part in an emotional learning task. The task consisted of 144 trials, during which three social targets (48 trials each), each conveying incongruent verbal and facial cues simultaneously, were randomly presented to the participants. Each target was coded so that a specific cue (verbal vs. facial) was determinative of his/her emotion. Participants were instructed to use the cues to guess the feelings of the targets and then received feedback on whether their response was correct.

Results : DIF score was negatively correlated to learning from verbal cues, r = - .294, p = .023, but not to learning from facial cues, r = - .144, p = .273. Therefore, we found the higher the difficulty in identifying emotions, the more deficient the learning from socio-emotional facial cues.

Conclusion : Based on our results, it can be concluded that difficulties in social cognition and emotion processing in individuals with higher levels of alexithymia extend to difficulties in emotional learning, particularly learning from verbal information.

Keywords : Alexithymia, Emotion Processing, Emotion Learning, verbal-cue, facial-cue, Feedback

Count: 513
Abstract ID: 469
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Poster

Investigating The Effect of Emotion Recognition on Prosocial Behaviors in Children

Submission Author: Sahar Saberijamal

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Background and Aim : Emotion knowledge enables children to identify emotions within themselves and others. Emotion recognition is an essential element of emotion knowledge, through which children can judge the appearances and values of various emotions. This ability enables children to empathize with others and effectively engage in prosocial behaviors like offering help when needed. Prosocial behavior is defined as voluntary and intentional actions aimed at benefiting others. The better children can understand the meaning of emotions expressed by their peers or adults, the better they can respond to the needs of others when necessary and show more empathy. While negative emotions, such as sadness, cause increased helping behavior in children, positive emotions, such as happiness, lead to lower prosocial behaviors in them. However, findings are scarce and inconsistent. Since no study has examined the effect of different emotions on prosocial behavior in preschool children, this study aims to investigate the effect of recognition of neutral, sadness, and happiness on the prosocial behavior of 5-7-year-old children. Moreover, it aims to find the possible relationship between empathy level and prosocial behavior in response to targets with sadness.

Methods : One hundred and one Iranian children participated in this study (Mean age = 6.09 years, SD = .85; 57 girls). Eight participants were excluded from further analyses. This left a sample of 93 children (Mean age = 6.11 years, SD = .84; 54 girls). A decision-making task was created to assess prosocial behavior in children. This task was a dictator game and consisted of one block: receivers' facial expressions were basic emotions of Happy, Sad, and Neutral expressions. The order of emotion presentation in each block was randomized. Before this task, children were given 4 stickers and they were asked to divide them between themselves and the target child as they preferred. Also, they had to report verbally each receiver's emotions.

Results : Kruskal-Wallis results showed that there was a significant difference between the averages of prosocial decision-making in response to neutral, sadness, and happiness (H = 12.22, p-value < .05). Bonferroni-adjusted pairwise comparisons revealed that happiness was associated with the most prosocial decision-making and children were more inclined to donate their stickers to this emotion (p-value < .05). Neutral and sadness, however, did not show any significant difference in prosocial decision making (p-value > .05). Moreover, Mann-Whitney U results indicated children with high empathy level and those with low empathy level do not differ significantly in their prosocial behavior towards sadness (z = -.92, p-value > .05).

Conclusion : This study suggests that children tend to act prosocial in response to happiness. Additionally, prosocial decisions in response to sadness are not affected by empathy level.

Keywords : Decision-making; Dictator game; Children

Count: 514
Abstract ID: 98
subject: Social Neuroscience: Other
Presentation Type: Poster

The effect of social hierarchy on spatial working memory

Submission Author: Elham Bakhshi

Elham Bakhshi [1]

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Background and Aim : Social hierarchy is an important success factor in social interactions. Different social structures can have different effects on cognitive abilities, such as working memory. One of the important topics that is considered in social cognition studies is the investigation of the influence of people's social position (social hierarchy) on cognitive functions. The present research tried to investigate the effect of the formation of social hierarchy on the spatial working memory through a behavioral study. In addition, the maze task was graded from easy to difficult between the acquisition phases and retrieval with a task difficulty of 30-seconds and 5-minutes.

Methods : In this study, same sex, littermates and the same weight rats that were born from the same mother were used and when the rats were weaned, they were placed in three groups in one cage. The tube test determined their social position (dominant, middle, subordinate) and the T-maze task assessed working memory performance.

Results : As a result, no difference in response accuracy between social groups at 30-seconeds difficulty level, but the subordinate group had a significant difference from the middle group in reaction time. At 5-minutes difficulty level, there was no difference in response accuracy and reaction time between social groups.

Conclusion : Generally, it was found that in the 30-second task difficulty, there is no difference in response accuracy between social groups and the subordinate group had the faster reaction time, while middle groups were slowest than the other groups. At 5-minutes difficulty level, there was no difference in response accuracy and reaction time between social groups.

Keywords : (Social hierarchy; spatial working memory; Accuracy; Reaction time)

Count: 515
Abstract ID: 15
subject: Social Neuroscience: Other
Presentation Type: Poster

Investigating the relationship between cyberspace use and sleep disorders in adolescents

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Background and Aim : Improper use of cyberspace by adolescents and young people following the development of social networks in recent years is one of the most important challenges in the country; the most common problem is sleep disorders. Sleep etiology is very complex. Sleep is a repetitive physiological and dynamic activity and one of the most important parameters of quality of life and health status. One of the most common problems among adolescents is sleep disorders. The aim of this study was to determine the relationship between cyberspace use and the incidence of sleep disorders among adolescents.

Methods : The present review was based on articles published in dissertations, quarterly magazines and in-house magazines in Noormags, Civilica, Magiran, Sid databases with the keywords of Cyberspace, Sleep disorder, Adolescents, Internet addiction. Then articles carefully studied and proper occasions is extracted

Results : According to this study, addiction to cyberspace and the Internet has increased sleep disorders in society, which is not unique to our country and has become a problem all over the world. Excessive use of available technologies until late at night has led to an increase in some diseases, including sleep disorders, which unfortunately in some people can lead to other diseases, such as heart disease or cancer.

Conclusion : Pathological and extreme use of cyberspace is a strong risk factor for adolescent sleep quality and increases the risk of sleep disorders in adolescents. Therefore, in order to reduce the negative effects of excessive use of cyberspace on adolescent sleep, it is necessary to intervene. Behavioral and cognitive behaviors with the aim of changing the patterns of cyberspace and Internet use and Educate users about the dangers of overuse of cyberspace.

Keywords : Cyberspace, Sleep Disorders, Adolescents, Internet

Count: 516
Abstract ID: 484
subject: Social Neuroscience: Other
Presentation Type: Oral

The interactive effects of glucocorticoids and β-adrenoceptors in the basolateral amygdala on the expression of fear memory in a passive avoidance task in male rats

Submission Author: Morvarid Meamar

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Background and Aim : The administration of glucocorticoids, either before or after fear memory reactivation, impairs the expression of fear memory. However, the mechanisms involved in this process are not yet fully understood. The aim of this study was to investigate the role of β-adrenoceptors in the basolateral amygdala (BLA) on fear memory in rats following intra-BLA corticosterone injection.

Methods : Cannulae were stereotactically implanted bilaterally into the BLA of male adult Wistar rats. The rats underwent training and testing using an inhibitory avoidance task (1 mA footshock for 3 s). 48 hours after the training session, corticosterone as a glucocorticoid receptor ligand (5, 10, or 20 ng/0.5 µl/side) and clenbuterol as a β2-adrenoceptor agonist (10 or 20 ng/0.5 µl/side) or propranolol as a β-adrenoceptors antagonist (250 or 500 ng/0.5 µl/side) were injected into the BLA bilaterally before or immediately after memory reactivation (retrieval, Test 1). We conducted subsequent tests two (Test 2), five (Test 3), seven (Test 4), and nine (Test 5) days after Test 1.

Results : The results showed that intra-BLA corticosterone injection before Test 1 impaired memory retrieval and reduced fear expression in Tests 2–5. This may be due to improved extinction or impaired reconsolidation. In Tests 2 and 5, the corticosterone injection following Test

1 also impaired reconsolidation and reduced fear expression. The effects of corticosterone on the expression of fear were prevented by clenbuterol but increased by propranolol.

Conclusion : The fear memory in corticosterone-treated animals was not recovered by the reminder shock, indicating that the process of reconsolidation, rather than extinction, was impacted. These findings suggest that glucocorticoids and β-adrenoceptors in the BLA jointly regulate the reconsolidation and expression of fear memory. Understanding the neurobiology of stress and the effects of glucocorticoids on fear memory may result in the development of novel therapies for trauma-related disorders such as post-traumatic stress disorder (PTSD).

Keywords : Glucocorticoids; β-adrenoceptors; Fear Memory; Basolateral amygdala; Passive avoidance task; Rats

Count: 517
Abstract ID: 431
subject: Social Neuroscience: Other
Presentation Type: Poster

The role of emotional empathy on Informational social Conformity: A tDCS study

Submission Author: Farzaneh AbdollahzadehBina

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Background and Aim : Informational social conformity refers to the phenomenon wherein individuals modify their beliefs or behavior in response to conforming with those whom they perceive to possess accurate information. Social conformity has been extensively examined across various domains, encompassing an emotional contagion in psychology and economics. The main aim of this study was to evaluate the effectiveness of transcranial direct current stimulation (tDCS) in influencing informational social conformity among individuals of high/low levels of Emotional Empathy, regardless of gender.

Methods : The approach utilized in this study entailed the selection of a statistical population, including students enrolled at the University of Tabriz. The participants were evenly distributed into two groups, taking into consideration their levels of Emotional Empathy. In the conducted experiment, participants were presented with the opportunity to make two options within each trial. The first decision was made without any social information, while the second decision was made with the inclusion of social information. This experimental design enabled us to directly see and analyze the conformity tendencies exhibited by participants across various scenarios. We used a total of two sessions of tDCS with the specific aim of targeting the ventromedial prefrontal cortex (vmPFC) region of the brain.

Results : Following the implementation of tDCS, social-informational conformity was enhanced among both groups, and Emotional Empathy had no moderating role in enhancing conformity behavior.

Conclusion : Enhancing informational social conformity in individuals, regardless of their levels of Emotional Empathy, is possible through applying tDCS. Moreover, modulating the activity of the vmPFC region has substantially impacted the inclination towards informational social conformity in individuals with high/low levels of Emotional Empathy regardless of their gender.

Keywords : tDCS; Emotional Empathy; Informational social conformity; vmPFC

Count: 518
Abstract ID: 74
subject: Social Neuroscience: Other
Presentation Type: Poster

Endocannabinoids reduce the expression of the alpha-3 subunits of the GABAA receptors of the basolateral amygdala during formalin-induced inflammatory pain modulation in adult male rats

Submission Author: Fateme Nasseri

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Background and Aim : Introduction: The basolateral amygdala (BLA) integrates cognitive and pain information and transmits it to the central nucleus of the amygdala, which is the origin of the descending pain modulatory pathway. The role of the BLA endocannabinoid system has been well shown in nociceptive processing. This system induces analgesia through its type 1 receptors and the GABAergic system inhibition. Therefore, this study aimed to investigate the gene expression changes of α2, α3, and β2-subunits of the GABAA receptors of the BLA in the antinociceptive role of the endocannabinoid system following the inflammatory pain induction.

Methods : Materials and Methods: In this study, the BLA tissue samples of male Wistar rats were used. 28 Male rats (220-270 grams) were randomly divided into four groups of seven rats, including the control (intact animals), formalin (formalin test in intact animals), DMSO (intra-BLA injection of DMSO 10 %), and AM251 (intra-BLA injection of AM251 50 ng/µl) groups. Following the formalin test, tissue samples were removed and stored in a -80 ℃ freezer. Gene expression of α2-, α3-, and β2-subunits of the GABAA receptors was evaluated by qRT-PCR technique.

Results : Results: Data analysis showed that formalin injection into the left paw only decreased the gene expression of the ?3 subunit of the GABAA receptor compared to the control group ($P<0.05$). Also, following the inflammatory pain induction, the injection of AM251 into the right BLA significantly decreased the gene expression of the ?3 subunit of the GABAA receptor

compared to the control group (P<0.05). Still, it had no significant effect on the gene expression of the ?2 and ?2-subunits of this receptor.

Conclusion : Conclusion: The findings of this study suggest that the presence of the α3 subunit in the heteropentameric structure of the GABAA receptor is probably necessary for the endocannabinoid system-induced analgesia in the basolateral amygdala.

Keywords : Keywords: Endocannabinoids, inflammatory pain modulation, GABAA receptors, Formalin

Count: 519
Abstract ID: 52
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Inflammation and angiogenesis in sporadic and NF2-related vestibular schwannoma

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Background and Aim : Vestibular schwannoma (VS) originates from the vestibular nerve it is located near vital brainstem structures. VS tumor microenvironments are complex and involve a variety of inflammatory mediators and immune cells that may affect tumor growth and behavior.

Methods : In a literature review, immunohistochemical, ELISA, and gene expression analysis were used to compare sporadic VS to neurofibromatosis type 2 (NF2)–related VS.

Results : Both types of VS showed increased expression of pro-inflammatory cytokines (TNF-α, IL-6, IL-1β) and chemokines (CCL2, CXCL10) compared to normal nerve tissue. However, NF2-related VS had higher levels of anti-inflammatory cytokines (IL-10, TGF-β) and regulatory T cells (FoxP3+) than sporadic VS. Moreover, NF2-related VS had lower microvascular density and lower expression of angiogenic factors (VEGF, Ang-2) than sporadic VS. These results suggest that NF2-related VS have a more balanced inflammatory response and a less angiogenic phenotype than sporadic VS, which may explain their slower growth rate and better response to anti-angiogenic therapy.

Conclusion : VS pathogenesis is associated with inflammation and angiogenesis, and biomarkers and therapeutic targets that can be used to modulate these processes are highlighted in our study.

Keywords : vestibular schwannoma; inflammation; angiogenesis; NF2

Count: 520
Abstract ID: 301
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Dimethyl Fumarate Can Reinforce the Therapeutic Potentials of Bone Marrow Mesenchymal Stem Cells through Trophic Factor Profile Enhancement

Submission Author: Nasrin Ghorbani

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Background and Aim : Numerous studies have confirmed the therapeutic efficacy of bone marrow derived mesenchymal stem cells (BM-MSCs) in addressing neurologic disorders. To date, several preconditioning strategies have been designed to improve the therapeutic potential of these stem cells

Methods : . This study was designed to evaluate the preconditioning effect of dimethyl fumarate (DMF) on expression of main trophic factors in human BM-MSCs. Initially, the identity of stem cells was confirmed through the evaluation of surface markers and their capacity for osteogenic and adipogenic differentiation using flow cytometry and differentiation assay, respectively. Subsequently, stem cells were subjected to different concentrations of DMF for 72 hours and their viability was defined by MTT assay. Following 72-hour preconditioning period with 10 µM DMF, gene expression was assessed by quantitative RT-PCR

Results : Our findings demonstrated that the isolated stem cells expressed cardinal MSC surface markers and exhibited osteogenic and adipogenic differentiation potential. MTT results confirmed that 10 µM DMF was an optimal dose for maintaining cell viability. Preconditioning of stem cells with DMF significantly upregulated the expression of BDNF, NGF, and NT-3. Despite a slight increase in transcript level of GDNF and VEGF after DMF preconditioning, this difference was not statistically significant

Conclusion : Our findings suggest that DMF preconditioning can enhance the expression of major neurotrophic factors in human BM-MSCs. Given the curative potential of both BM-MSCs and DMF in various neurological diseases models and preconditioning outcome, their combined use may synergistically enhance their neuroprotective properties.

Keywords : : Bone marrow mesenchymal stem cells; Dimethyl fumarate; Preconditioning; Trophic factors; Neurological diseases

Count: 521
Abstract ID: 414
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Endoscopic versus open approach releasing the median nerve in carpal tunnel syndrome: a systematic review and meta-analysis

Submission Author: Arabbafrani Melika

Arabbafrani Melika[1], Vafa Rahimi movaghar[2], Melika Arab Bafrani[3], Arman Zeinoddini[4], Zahra Ghodsi[5], Vali Baigi[6], Ahmadreza Pourrashidi[7], Forough Yazdanian[8], Mohammad Sana Mirahmadi[9]

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Background and Aim : Carpal tunnel syndrome (CTS) accounts for the most common peripheral neuropathy that surgeons face in their clinics. Despite several studies comparing open and endoscopic carpal tunnel release, the best option is yet to be identified. In this systematic review, we are trying to provide organized information about these two approaches and summarize the studies that compare the outcomes.

Methods : In this study, the search was performed using EMBASE and MEDLINE search engines (via OVID SP), Scopus, Web of Science, and Cochrane library until January 2021. We extracted and compared the following data between open and endoscopic carpal tunnel release: operation time, CTS-severity and functional scores, pain score, time to return to work, satisfaction rate, surgical site hematoma, recurrence and revision surgery, and scar tenderness. We performed a meta-analysis if at least three studies reported the prognostic factor.

Results : Our results (extracted from 30 RCTs) revealed a significantly higher satisfaction rate and postoperative functional score, besides lower postoperative severity score, duration of the surgery, and time to back to work in endoscopic versus open surgery. Furthermore, open carpal tunnel release had more surgical site hematoma, scar tenderness, recurrence, and revision surgery than endoscopic one.

Conclusion : In summary, our study revealed a more favorable outcome after endoscopic carpal tunnel release in terms of the operation time, satisfaction rate, and back to work time. It should be considered that surgeons' experience and passing the learning curve are crucial to achieving these results, then the precise learning curve must be clarified in future studies.

Keywords : Endoscopic carpal tunnel release, Open carpal tunnel release, Carpal tunnel syndrome

Count: 522
Abstract ID: 501
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Investigating the effect of Satureja Khuzestanica essential oil on hepatotoxicity induced by malathion and parathion in male Wistar rats.

Submission Author: Javad Khalili Fard

Javad Khalili Fard

Background and Aim : -Introduction: Among the pesticides that affect the nervous system two organophosphorus pesticides malathion and parathion have been frequently used. Exposure of non-target organisms to these insecticides leads to oxidative stress causing tissue damage including hepatotoxicity. Satureja Khuzestanica essential oil (SKEO) exerts antioxidant potential and reduces the damages caused by oxidative stress. In this study, the effect of SKEO on splenotoxicity caused by malathion and parathion was investigated

Methods : -48 male wistar rats were randomly divided in 6 groups. Group 1 control, group 2 SKEO (25 mg/kg), group 3 malathion (0.3 mg/kg), group 4 parathion (0.004 mg/kg), group 5 malathion (0.3 mg/kg) + SKEO (25 mg/kg), group 6 parathion (0.004 mg/kg) + SKEO (25 mg/kg). After 10 days of treatment rats were anesthetized and liver tissues obtained and after tissue processing, the slides were stained with hematoxylin and eosin for histopathologic evaluation (fibrosis, necrosis and steatosis). The results were statistically analyzed using one way ANOVA ($P<0.05$).

Results : -malathion and parathion induced hepatotoxicity after ten days of treatment and SKEO (25 mg/kg) significantly reduced hepatotoxicity induced by these two organophosphorus pesticides

Conclusion : Although exposure to malathion and parathion were associated by hepatotoxicity (fibrosis, necrosis and steatosis), but the type of plant can be effective in reducing these side effects due to its characteristics such as antioxidant properties. SKEO contains chemicals such as carvacrol with potent antioxidant effects so that SKEO significantly reduced hepatotoxicity induced by malathion and parathion.

Keywords : Satureja Khuzestanica essential oil, malathion, parathion, hepatotoxicity, tissue damage

Count: 523
Abstract ID: 622
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Evaluation of temozolomide drug concentration in blood plasma for treatment of glioblastoma tumor: an animal study

Submission Author: اکرم شهیدانی

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Background and Aim : Brain tumors are considered to be one of the most important challenges of neurology and their occurrence is possible age groups have increased, especially in older age groups. Glioblastoma is the most common and malignant type in the wide range of glial brain tumors, which cannot be completely removed by surgery. The survival time of glioblastoma patients is only 12-15 months so less than 5% of patients survive more than 5 years even after treatment. Unlike most aggressive malignancies, glioblastoma appears to grow only within the brain. In this way, extracranial metastasis is rarely seen. However, glioblastoma cells have a destructive effect on brain tissue and function. The heterogeneity of the tumor and its surrounding environment makes glioblastoma one of the most difficult cancers to treat. Since 1970, radiation therapy has been recognized as a standard adjuvant treatment alongside invasive surgery for glioblastoma multiform (GBM). Radiation therapy leads to increased patient survival. Since 2005, temozolomide (TMZ) has been used as a routine chemotherapy and, in other words, a standard treatment for GBM, along with radiation therapy and then adjuvant chemotherapy. Despite the presence of the blood-brain barrier (BBB) as a natural protection of the brain, it is difficult for this drug to pass into the tumor tissue, that's why researchers are looking for physical methods such as sonoporation and electroporation to open the BBB reversibly. Since the concentration of TMZ drug in the cerebral vessels is important when the BBB is opened, this study investigated the time of the maximum concentration of the drug TMZ in the blood.

Methods : In this study, rats were used to measure the concentration of TMZ drug in plasma. TMZ drug (Subhan Oncology pharmaceutical company) was administered to the animal by gavage. After anesthetizing the rat using a combination of ketamine and xylazine, blood samples were taken from the abdominal aorta at 30, 60, 90, and 120 minutes after drug gavage. The time interval between taking the drug and using a physical method to represent the BBB is determined from the time of the maximum concentration of the drug in plasma.

Results : Optical density results are presented as mean ± standard deviation (SD). The Optical densities are 1.07, 1.88, 0.64, and 0.64 and the SD are 0.14, 0.37, 0.05, and 0.47 for 30, 60, 90, and 120 minutes after drug gavage, respectively.

Conclusion : The greatest concentration of TMZ in blood plasma is 60 minutes after the gavage of the drug to rats. Therefore, in the treatment of glioblastoma tumors using physical methods, the best time interval between taking the drug and the maximum permeability of the BBB is 1 hour.

Keywords : Glioblastoma multiform tumor, Temozolomide drug, Blood-brain-barrier

Count: 524
Abstract ID: 282
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Oral

Bioinspired Nanofiber scaffold for nerve tissue engineering

Submission Author: Shohreh Mashayekhan

Shohreh Mashayekhan[1], Fatemeh Rasti Boroojeni[2], Mohammad Mohammadi [3]

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Background and Aim : Nerve injuries remain among the most challenging medical issues despite numerous efforts to devise methods for functional regeneration of defects.

Methods : In this regard, the current study offers a holistic perspective in design dual-electrospun films based on polyaniline/graphene (PAG) incorporated poly(e-caprolactone) (PCL) and gelatin nanofibrus scaffold by considering the mechanical, topographical, electrical and biological aspects which are crucial for a successful nerve regeneration.

Results : In case of peripheral nerve tissue engineering, PCL and gelatin were employed to serve this purpose in the form of dual-electrospun films which were rolled and later shaped the assembly of a multichannel conduit. PAG nanocomposite was incorporated to endow the conduit with conductive properties. FTIR analysis, water contact angle measurements, and SEM observations as well as mechanical and conductivity tests were used to evaluate the properties of the conduits. In addition, MTT assay was conducted to assess the proliferation of rat bone marrow-derived mesenchymal stem cells (MSC) cultured on the films. Incorporating 2% PAG proved to have superior cell support and proliferation, while guaranteeing electrical conductivity of 10.8 × 10-5 S/cm and remarkable tensile strength of 14.12 ± 3.1 MPa for dry conditions. In case of central nerve tissue engineering, a hybrid PCL-gelatin nanofiber scaffold mimicking the native extracellular matrix and axon morphology to direct the differentiation of bone marrow-derived neural stem cells (NSCs) to oligodendrocyte cells (OLCs) was introduced. In order to achieve a sustained release of T3, this factor was encapsulated within chitosan nanoparticles and chitosan-loaded T3 was incorporated within PCL nanofibers. PAG nanocomposite was incorporated within

gelatin nanofibers to endow the scaffold with conductive properties, which resemble the conductive behavior of axons. Biodegradation, water contact angle measurements, and SEM observations as well as conductivity tests were used to evaluate the properties of the prepared scaffold. The concentration of PAG and T3-loaded chitosan NPs in nanofibers were optimized by examining the proliferation of cultured bone marrow-derived MSCs on the scaffolds. The differentiation of MSCs-derived NSCs cultured on the fabricated scaffolds into OLCs was analyzed by evaluating the expression of oligodendrocyte markers using immunofluorescence (ICC), RT-PCR and flow cytometry assays. Incorporating 2% PAG proved to have superior cell support and proliferation while guaranteeing desired electrical conductivity. Moreover, the scaffold containing 2% of T3-loaded chitosan NPs was considered to be the most biocompatible samples. Result of ICC, RT- PCR and flow cytometry showed high expression of O4, Olig2, platelet-derived growth factor receptor-alpha (PDGFR-α), O1, myelin/oligodendrocyte glycoprotein (MOG) and myelin basic protein (MBP).

Conclusion : Overall, the observed results in terms of surface topography, biocompatibility, electrical conductivity and gene expression, highlight the great potential of the fabricated dual-electrospun PCL/gelatin scaffold with specified characteristics for both peripheral and central nerve tissue engineering.

Keywords : Nanofibers Scaffold, Oligodendrocyte Cells, Controlled Triiodothyronine Release, Central Nervous System, Polyaniline graphene

Count: 525
Abstract ID: 157
subject: Special topics: Neuro-aesthetics, Art and Creativity
Presentation Type: Oral

Defective complex III mitochondrial respiratory chain due to a novel variant in CYC1 gene masquerades acute demyelinating syndrome or Leber hereditary optic neuropathy

Submission Author: Maryam Rasoulinezhad

Maryam Rasoulinezhad[1]

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Background and Aim : Complex III (CIII) is the third out of five mitochondrial respiratory chain complexes residing at the mitochondrial inner membrane. The assembly of 10 subunits encoded by nuclear DNA and one by mitochondrial DNA result in the functional CIII which transfers electrons from ubiquinol to cytochrome c. Deficiencies of CIII are among the least investigated mitochondrial disorders and thus clinical spectrum of patients with mutations in CIII is not well defined.

Methods : We report on a 10-year-old girl born to consanguineous Iranian parents presenting with recurrent visual loss episodes and optic nerve contrast enhancement in brain imaging reminiscent of an acquired demyelination syndrome (i.e. optic neuritis or multiple sclerosis), who was ultimately confirmed to have a novel homozygous missense variant of unknown significance, c.949C > T; p.(Arg317Trp) in the CYC1 gene, a nuclear DNA subunit of complex III of the mitochondrial chain. Sanger sequencing confirmed the segregation of this variant with disease in the family. The effect of this variant on the protein structure was shown in-silico.

Results : Our findings, not only expand the clinical spectrum due to defects in CYC1 gene but also highlight that mitochondrial respiratory chain disorders could be considered as a potential differential diagnosis in children who present with unusual patterns of acquired demyelination syndromes (ADS).

Conclusion : In addition, our results support the hypothesis that mitochondrial disorders might have an overlapping presentation with ADS.

Keywords : Acquired demyelinating syndrome; CYC1; Complex III deficiency; Mitochondrial leukoencephalopathy.

Count: 526
Abstract ID: 620
subject: Special topics: Neuro-aesthetics, Art and Creativity
Presentation Type: Poster

The Paradigm of Complexity in Neuroscience: The inability of neuroaesthetics to explain the various dimensions of the beauty experience as a case study

Submission Author: Gooya Bozorgi

Gooya Bozorgi[1]

1. Lecturer in IT and computer graphic design, Iran Technical & Vocational Training Organization

Background and Aim : Today, neuroscience is the focal point of cognitive science and mind studies. The scope of this science has been expanded to Classical philosophical topics, such as the problem of consciousness and aesthetics. However, due to the specialized and reductionist framework of neuroscience, it is feared that the complexities of reality may be overlooked. Therefore, including the complexity paradigm in neuroscience is a necessity. The purpose of this article is to show this issue.

Methods : Focusing on neuroaesthetics (especially in art and literature), it has been shown that the analysis based on color pictures of the brain and neural correlations in the experience of beauty is not enough to explain the various dimensions of the aesthetic issue. So, expanding the scope of the discussion to a higher level, that is cognitive neuroscience gives us a better understanding of the subject of work (for example, in Neurocognitive poetics), although this is not enough by itself.

Results : The findings of this research indicate the inadequacy of neuroscience alone in explaining a complex issue such as the experience of beauty. Inevitably, neuroaesthetics should be considered in overlapping complex multidisciplinary interactions and under the considerations of complexity science, because the paradigm of complexity is in opposition to any reductionist thinking.

Conclusion : Some problems of neuroscience are very complex due to their multidisciplinary nature, therefore, it is necessary to examine them in transdisciplinary contributions with the requirements of complexity science.

Keywords : Neuroscience; Neuroaesthetics; Complexity; Multidisciplinary; Reductionism; Complexity science.

Count: 527
Abstract ID: 360
subject: Special topics: Neuroethics
Presentation Type: Poster

Neurodiversity Based on Individualism: A Paradigm Shift Through Liberalism for Inclusion

Submission Author: Ardeshir Nabizadeh zolpirani

Ardeshir Nabizadeh zolpirani[1]

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Background and Aim: Liberalism is a political and moral philosophy centered on individual rights, liberty, the right to private property, and equality before the law. Neurodiversity, celebrating human neuro-cognitive diversity such as autism, ADHD, and dyslexia, as natural variations of the human brain, aligns with liberalism's principles, emphasizing individual rights, equality, and inclusion. In this study, we discussed the challenges of neurodiversity through a liberal lens. Method: Research materials were extracted from 20 references using, Google Scholar, and Google Books by the combination of the keywords: neuroethics; neurodiversity; Individualism; and liberalism. Results: Liberalism, whether viewed as a political or philosophical framework, is characterized by its strong emphasis on individual rights and freedoms, aspiring to establish a society where every person enjoys the autonomy to pursue their dreams and aspirations. This aligns seamlessly with the principles of neurodiversity, which assert that neurodiverse individuals should have equal rights and opportunities as their neurotypical counterparts, thus challenging and redefining traditional norms of "normalcy." This perspective resonates with liberal ideals of diversity and inclusion, creating a societal landscape where individuals, regardless of their neurological differences, can effectively engage and contribute. By reshaping societal structures and policies to accommodate diverse cognitive styles, liberalism seeks to create environments where the strengths of neurodiverse individuals can truly flourish. However, a significant challenge arises in the tension between individual freedom, a cornerstone of liberalism, and societal expectations. While liberalism promotes personal autonomy, it can inadvertently marginalize neurodiverse individuals by emphasizing conformity to societal norms. This tension underscores the urgent need for liberal society to adapt and become more inclusive of neurodiversity, bridging the gap between individual rights and broader societal acceptance. The educational system in liberal societies faces challenges in accommodating neurodiverse individuals, necessitating the development of more inclusive educational practices and policies. Communication and understanding, crucial in liberal societies, can be challenging for neurodiverse individuals, emphasizing the need for recognition and accommodation of diverse communication styles. Education is a shared cornerstone of liberalism and the neurodiversity movement, and by adapting teaching methods to cater to diverse learning styles, liberalism can create an educational environment that respects and nurtures the potential of neurodiverse students. Additionally, in alignment with liberal principles, the economic landscape should adapt to provide equal

employment opportunities, reasonable accommodations, and diverse working environments for neurodiverse individuals. Finally, liberalism's advocacy for equality of opportunity underscores the importance of removing barriers faced by neurodiverse individuals in education, employment, and other aspects of life, with the government playing a role in protecting individual rights. Conclusion: both liberalism and the concept of neurodiversity share common ground in their focus on individual rights, inclusivity, and diversity celebration. Challenges exist in integrating neurodiversity within the liberal framework, but the principles of liberalism provide a solid foundation for a more inclusive society accommodating individuals with diverse cognitive abilities. While complex intersections between neurodiversity and liberalism exist, the harmonization of personal autonomy with societal expectations presents both challenges and significant opportunities for a more equitable, diverse, and inclusive future.

Keywords : neuroethics; neurophilosophy; neurodiversity; Individualism; liberalism

Count: 528
Abstract ID: 158
subject: Special topics: Neurophilosophy
Presentation Type: Poster

Psychedelic, mystical experiences, illusion or reality

Submission Author: Elyas Rezaie

Elyas Rezaie

Background and Aim : By proposing the theory of religious experience, Schleier Macher wanted to keep religion away from the encroachment of science and reason, but new scientific researches and findings made this opinion face a serious problem. Psychoactive substances as well as electromagnetic stimulation of parts of the brain can create experiences that are very similar to mystical experiences. It is conventional mysticism, that is, meditation, exercise, etc. come into existence, and therefore they have no transcendental or divine aspects beyond the experiencer's attitude, and if this is not the case, religious experience can no longer prove the statement "God exists". In this research, based on the findings and new research conducted in the field of neuroscience of psychedelic and mystical experiences, we have evaluated the effectiveness of the proof of religious experience.

Methods : Library method

Results : New scientific researches and findings indicate that the experiences of consuming psychedelic drugs are very similar to mystical experiences. Even some researches show that some of these experiences can be created by electro-magnetic stimulation of parts of the brain. The studies indicate the special influence of the experiencer's culture in creating such an experience, however, it cannot be concluded from these studies that mystical experiences are illusory.

Conclusion : The scientific explanation and especially the neuroscience of mystical experiences is the most important challenge facing the proof of religious experience, which, although it has not been able to completely destroy this proof, but it has lost some of its leaves. because before the religious experience wants to prove the existence of the divine thing, it must be assumed from the beginning, and if it is not assumed, it will not achieve such an experience. Especially the neurology of mystical experiences, which of course has not been realized so far, cannot mean the negation of the cause of their transcendence, due to the special complexity of these types of experiences, only experimental and psychological research on them is not enough, and the interdisciplinary cooperation of many other sciences In any case, we should allow the investigation to continue and we should wait because premature judgment hinders progress.

Keywords : Religious experience, psychedelic, mystical experiences, neuroscience, hallucinogenic

Count: 529
Abstract ID: 173
subject: Special topics: Public Awareness
Presentation Type: Poster

The effectiveness of integrated trauma system implementation on road traffic fatalities and injuries in the north of Iran using an interrupted time series analysis

Submission Author: Shahryar Ghashghaie

Shahryar Ghashghaie[1]

1. Tehran University of Medical Sciences

Background and Aim : The importance of implementation of integrated trauma systems (IITS) in decreasing traffic crash-related injury and mortality has been documented in some settings, but the structure and potential effect of IITS may not be the same in different settings. The aim of this study was to determine the effectiveness of IITS in the province of Guilan, Iran.

Methods : This descriptive-analytical study was done using a time series model in the north of Iran during 2015- 2019. In the first phase, data was collected on road traffic crashes (RTC) for two provinces: Guilan (IITS) and Mazandaran (no IITS). Weather conditions were included as potentially confounding variables in the model. The IITS contained integrated interventions on prevention, controlling RTC and improvement of the road facilities and emergency systems. Interrupted time series analysis (ITSA) was used to compare the traffic crash data before and after the intervention in both Guilan and Mazandaran provinces. The incidence of crashes was compared between two years' post-IITS and two years pre-IITS.

Results : In the first phase of the study, the daily mean (SD) of RTC in Guilan province was 38.4 (16.7) before IITS, which decreased to 30.8 (13.7) afterward. In Mazandaran province (as control) the daily average number of RTC was 37.29 (14.1) which increased to 42.55 (16.4) post IITS. In Guilan, the daily mean incidence of mortality, was 27.74 (12.6) pre-IITS and 26.60 (11.9) post-IITS. On the other hand, in Mazandaran, the daily mean incidence of mortality pre-IITS and post-IITS were 32.16 (14.5) (in Guilan) and 51.75(15.7) respectively. Analysis indicated that the mortality and injury incidence increased significantly at the time of intervention (21 March 2017) and decreased significantly after it in Guilan (P-value<0.001). (Coefficient of mortalities and injuries: -1.0197, coefficient of crashes: -0.019).

Conclusion : The results indicated that prevention of RTC is achievable in Iran. The IITS in the North of Iran had an effect on decreasing RTC and related mortality and injury. Continuous efforts are needed for the implementation of other components of this plan and its development at the national level.

Keywords : Integrated Trauma System; Traffic; Interrupted Time Series Analysis; Wounds and Injuries; Mortality

Count: 530
Abstract ID: 243
subject: Special topics: Public Awareness
Presentation Type: Poster

A Comprehensive Scientometric Study of Neurosurgical Research in Iran: Quantifying Quantity, Quality, and Level of Evidence

Submission Author: Seyedyasin Tabatabaeimehr

Seyed yasin Tabatabaeimehr [1], Vafa Rahimi-Movaghar[2], Kiarash bakhshandeh[3], Parsa saberian[4], Mahdi rezaee[5], Farzin farahbakhsh[6], Mohammad Mirahmadi Eraghi[7], Soheil pourheidar[8], Seyed Mahdi mousavi nasab[9]

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A considerable increase in amount and quality of Iranian papers was observed during the past decade as reflected in a higher number of paperscategorized in upper LOE classes.

Keywords : Iran, level of evidence, neurosurgery, publication

Count: 531
Abstract ID: 122
subject: Special topics: Public Awareness
Presentation Type: Poster

The Prevalence of Helmet Use in Motorcyclists around the World: a systematic review and Meta-analysis of 5,006,476 Participants

Submission Author: Sina Shool

Sina Shool[1], Vafa Rahimi-Movaghar[2], Gerard O'Reilly[3], Seyed Mohammad Piri[4], Zahra Ghodsi[5], Reza Tabrizi[6], Mohammad Hosein Amirzade-Iranaq[7], Mahdieh Mashayekhi[8], Mohammad Amin Dabbagh Ohadi[9]

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Background and Aim : Road traffic injuries present a significant public health burden, especially in developing countries.

Methods : This systematic review and meta-analysis synthesized global evidence on motorcycle helmet use prevalence by including 299 records across 249 articles involving 5,006,476 participants from 1982 to 2022.

Results : The findings revealed a declining trend in helmet use prevalence over the past four decades, with an overall prevalence of 48.71%. The meta-regression analysis did not find any statistically significant change in the overall prevalence. Subgroup analysis showed higher helmet use prevalence in observation/survey records (54.29%) compared to crashed patient records (44.84%). Drivers demonstrated a higher likelihood of wearing helmets than passengers in both observation/survey records (62.61% vs. 28.23%) and crashed patient records (47.76% vs. 26.61%). The African continent had the lowest helmet use rates, while Latin America and the Caribbean regions had higher rates.

Conclusion : This study provides a comprehensive overview of global helmet use prevalence, emphasizing disparities between high and low-income countries, variations in law enforcement, and trends over four decades. Targeted interventions are necessary to improve helmet-wearing habits, especially among passengers and regions with low usage rates. Effective legislation and awareness campaigns are crucial for promoting helmet use and reducing road traffic injuries' burden.

Keywords : Motorcycles; Head injuries; Mortality; Head protective devices; Systematic Review

Count: 532
Abstract ID: 17
subject: Special topics: Public Awareness
Presentation Type: Poster

The impact of Vitamin D Supplementation on the Quality of Life in adults: A systematic review of randomized controlled trials

Submission Author: Faezeh Moeini Badi

Faezeh Moeini Badi [1]

1. M.Sc. Student, Student Research Committee, School of Allied Medical Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : Vitamin D is a prohormone produced in the skin through the conversion of 7-hydroxycholesterol to vitamin D3, followed by a two-step process of hydroxylation in the liver and kidneys to yield 25(OH) vitamin D and 1,25(OH) vitamin D (1). Low vitamin D status is a risk factor resulting from reduced sunlight exposure due to latitude, limited mobility, or cultural practices (2). In addition to sun exposure, Vitamin D can also be obtained through dietary sources and supplementation. Recent studies show that doses of 400-4000 IU/D or 40,000-120,000 IU/month of vitamin D increase serum 25(OH) D concentrations without side effects (3, 4). Some studies have shown that vitamin D deficiency is associated with poor quality of life (5-7). The mechanism by which vitamin D status may affect the quality of life is unknown. However, vitamin D may play a role in maintaining a good quality of life through cardioprotective and anti-depressant effects (8, 9). Therefore, in this study, we conducted a systematic review of randomized controlled trials to determine whether vitamin D supplementation can affect quality of life.

Methods : For this review, we systematically searched PubMed and Google Scholar to gather essential information. We reviewed several articles published until September 2023 and obtained the results of these studies. To find the articles, we used the search strategy of "vitamin D" OR "Cholecalciferol" OR "Hydroxycholecalciferols" OR "calciferol" AND "quality of life" OR "QoL" and all of its components.

Results : We found 181 studies on vitamin D Supplementation and quality of life, but only 24 publications met the criteria for systematic review. After applying inclusion and exclusion criteria, we found eight randomized clinical trials. The results showed that adults over 18 who were supplemented with vitamin D had improvement in quality of life. Vitamin D supplementation

seemed to positively affect the Mental and Physical Composite Scores. These findings were based on an analysis of various articles.

Conclusion : The consumption of vitamin D has been found to improve the quality of life. Vitamin D may specifically improve Mental and Physical Composite Scores.

Keywords : Cholecalciferol, QoL, Systematic review, Supplement

Count: 533
Abstract ID: 563
subject: Special topics: Public Awareness
Presentation Type: Poster

from heart to brain: a potential intervention with vague nerve stimulation to improve depressive condition

Submission Author: Zakieh Sheikhalishahi

Zakieh Sheikhalishahi[1]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Cardiovascular disease are major cause of death worldwide. Myocardial infarction (MI) and heart failure (HF) are associated with autonomic dysregulation characterized by a sustained increase in sympathetic drive and by withdrawal of parasympathetic activity.

Methods : research materials were extracted from 23 articles using the following data base : Google scholar & Science Direct , by using the key words: myocardial ischemia, vagus stimulation, intrinsic cardiac nervous system(ICNS)

Results : Previous clinical studies have shown that cardiac autonomic imbalances, in terms of reduced vagal activity and over-activated sympathetic activity, are involved in the pathogenesis of myocardial I/R injury. Modulation of parasympathetic activation as potential therapy for MI has received only limited attention over the years given its complex cardiovascular effects. Vagus nerve stimulation (VNS) could reduce the injury of myocardial ischemia, limit infarct size, and improve ventricular function so reduce acute mortality. VNS exerts its cardioprotective effects through various mechanisms, including the modulation of autonomic nervous system activity, anti-inflammatory effects, enhancement of endothelial function, and attenuation of oxidative stress.

Conclusion : Vagus nerve stimulation holds significant potential as a therapeutic intervention in myocardial ischemia. By modulating multiple pathways involved in the pathogenesis of ischemic injury, VNS has shown promising results in reducing infarct size, improving cardiac function, and enhancing overall patient outcomes. Further research and larger clinical trials are warranted to fully elucidate the mechanisms of VNS and optimize its application in the management of myocardial ischemia

Keywords : myocardial ischemia, vague stimulation, heart brain axis

Count: 534
Abstract ID: 457
subject: Special topics: Public Awareness
Presentation Type: Poster

Differences in Spinal Injuries between motorcyclists and motor vehicle occupants: A Report from the National Spinal Cord and Column Injury Registry of Iran

Submission Author: Vali Baigi

Vali Baigi[1], Zahra Azadmanjir[2], Moein Khormali[3], Zahra Ghodsi[4], Mohammad Dashtkoohi[5], Mohsen Sadeghi-Naini[6], Khatereh Naghdi[7], James S. Harrop[8], Vafa Rahimi-Movaghar[9]

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Background and Aim : To investigate traumatic spinal injury patterns between motorcycle and motor vehicle occupants using data from the National Spinal Cord and Column Injury Registry of Iran (NSCIR-IR).

Methods : This study was conducted using data from NSCIR-IR from January 2017 to December 2021. The injured cases were divided into two groups based on the type of vehicle at the time of injury, including motorcycle (riders/pillion passengers) and car occupants (drivers/passengers). The chi-square test was used to compare the patterns of vertebral fracture between the two groups.

Results : One-thousand two hundred and ninety-three patients were included in the analysis, consisting of 1000 (77.3%) motor vehicle occupants and 293 (22.7%) motorcycle drivers and occupants. The overall mean number of fractures was 2.2 (SD=1.5) for car occupants and 1.9 (SD:

1.4) for the motorcycle group (p=0.006). There was a statistically significant difference between the groups in the frequency of fractured vertebrae C5, C6, C7, T2, L1, S1, and S2. In the motorcycle group, 16 patients (5.6%) had C5 fracture, while car occupants 102 (10.2%) had C5 fractures (p=0.01). 438 (19.9%) fractures in car occupants and 167 (29.6%) fractures in motorcyclists were of A3 and A4 fracture types.

Conclusion : Overall, the findings of the study illustrated a significant energy transfer pattern and subsequent vertebra between car occupants and motorcyclists. This data may provide more insight into designing better protection for motorcycle and vehicle injuries.

Keywords : Spinal Injuries, Traffic Accidents, Motor Vehicles, Automobiles, Spinal Fractures

Count: 535
Abstract ID: 136
subject: Special topics: Art and Neuroscience
Presentation Type: Poster

Renal Denervation Influences Angiotensin II Types 1 and 2 Receptors

Submission Author: Hajaralsadat Hosseini-Dastgerdi

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Background and Aim : -The sympathetic nervous system (SNS) and renin-angiotensin systems (RAS) are two critical regulatory systems in the kidney which affect renal hemodynamics and function. These two systems interact with each other so that angiotensin II (Ang II) has the presynaptic effect on the norepinephrine secretion. Another aspect of this interaction is that the SNS affects the function and expression of local RAS receptors, mainly Ang II receptors. The relationship between sympathetic activity and Ang II receptors expression in the kidney is a scientific challenge.

Methods : -In this review, various popular databases such as PubMed, Google Scholar, and Scopus were considered for related information. In the reviewed studies, the evaluation of receptors using different methods, such as ligand binding assay, real-time PCR, immunohistochemical assay, western blot, and ELISA has been used.

Results : -The density, number, or affinity of glomerular Ang II receptors increased in normotensive rats after renal denervation (RDN). In the two kidneys one clip rat model, the results showed a upregulation in Ang II receptors mRNA expression in the clipped kidney; however, RDN caused normalization of their expression. In Chronic heart failure (CHF), Due to the increased activity of SNS, the balance of AT2R and AT1R expressions varies, and AT1R expression is higher than AT2R. unilateral RDN by the effect on the transcription or trafficking of AT1R and AT2R results in a near-normal gene expression pattern. On the other hand, in the animal model of

cardiomyopathy, the RDN caused the downregulation of the Ang II/ACE/AT1R axis and the upregulation of the Ang-(1–7)/ACE2/Mas-R axis. In a model of cardiorenal syndrome, the upregulation of angiotensinogen and AT1aR mRNA expression occurred in the left ventricle, downregulation was detected in the renal cortex, and these changes were refined by bilateral RDN. In rats with Aortic regurgitation, SNS activity increases levels of AT1aR and angiotensinogen mRNA in renal cortical tissue and RDN suppresses them. Studies have shown that in polycystic kidney disease rats model, the mRNA expression level of AT1aR in kidney decreases and bilateral RDN does not impact RAS, which may be because other pathways involved in controlling intrarenal RAS, such as the prorenin receptor and prostaglandins, offset RDN effect. In addition, STZ-induced diabetes decreases the number of Ang II glomerular sites and increases the expression of AT1R in the cortical and outer medullary collecting duct and RDN refines these phenomena. Finally, a combination of myocardial infarction and RDN reduces the levels of norepinephrine, Ang II, cardiac Ang II, and AT1R.

Conclusion : The SNS activity definitely affects RAS in the kidney. RDN is associated with changes in the expression of Ang II receptors that may vary in normal conditions and diseases. So, interference in sympathetic activity with the RAS in the kidney is dependent on the expression and activity of the Ang II receptors.

Keywords : renal denervation; renin-angiotensin systems; Ang II receptors

Count: 536
Abstract ID: 276
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Prognosis of the stroke occurring after COVID-19 based on d-dimer and inflammatory markers: A meta- analysis

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Background and Aim : In light of the importance of inflammatory biomarkers and stroke in COVID-19 prognosis, the purpose of this study is to assess the mortality of stroke in COVID-19 patients depending on the level of inflammatory biomarkers, by consideration of the temporality of stroke manifestations after COVID-19 infection.

Methods : The association of stroke, inflammatory biomarkers, and D-dimer with mortality in patients with COVID-19 were studied using mixed method meta-regression analysis. The rate of death was used as the effect measure. The protocol of this study was registered on PROSPERO by the CRD42023383065 registration number.

Results : Three investigations included a total of 2725 COVID-19 individuals, including 96 patients with stroke who had COVID-19. Among the inflammatory biomarkers, only CRP was discovered to be appropriate for pooled analysis. Significant positive interactions with CRP were detected for both the stroke and non-stroke group ($P < 0.001$), with the interaction with the stroke group being more severe. In the interaction model for D-dimer, the stroke group had a substantial positive interaction ($P < 0.001$), but with the non-stroke group the interaction was not statistically significant ($P = 0.158$).

Conclusion : This study discovered the role of CRP and D-dimer in stroke prognosis in COVID-19 patients. This mixed model meta-regression analysis produced moderate quality evidence.

Keywords : Inflammatory biomarker, meta-analysis, COVID-19, stroke

Count: 537
Abstract ID: 139
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Oral

The effect of transcranial direct-current stimulation on prolonged anosmia/ hyposmia in patients with COVID-19

Submission Author: Naseh Yousrfi

Naseh Yousrfi[1], Naseh Yousefi[2]

1. -
2. Physical medicine and rehabilitation specilaist

Background and Aim : Olfactory dysfunction has been reported by many patients with COVID-19 .Most patients recover quickly, but in some patients the symptom persists for two months. As yet, there has been no report on the effectiveness of the Transcranial Direct-Current Stimulation method to treat prolonged COVID-19 associated anosmia or hyposmia.

Methods : In thispre-post pilot study, thirteen patients with COVID-19, who exhibited prolonged anosmia/ hyposmia. Patients received four sessions (every other day) of tDCS. Olfactory sensitivity was assessed by Smell Identification Test (SIT) before the intervention and one week after four sessions of treatment.

Results : The minimum pre-treatment SIT score was 8 (anosmia), and the maximum post-treatment SIT score was 21 (normosmia). An increase in SIT score was observed in all patients, compared to pre-treatment

Conclusion : It can be concluded that using the tDCS can improve prolonged anosmia/ hyposmia in COVID-19 patients. Further clinical trials are needed to confirm these preliminary results.

Keywords : Transcranial Direct-Current Stimulation, Olfactory dysfunction Anosmia, Hyposmia, COVID-19, Smell Identification Test, Olfactory syfunction

Count: 538
Abstract ID: 7
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Guillain-Barré Syndrome Following COVID-19 Vaccine: a case-report

Submission Author: Mohammad Sadegh Fakhari

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Background and Aim : Coronavirus disease is a viral infection affecting different organs with various morbidities and mortality. Vaccines are used to control the disease. COVID-19 vaccines have brought many benefits but their adverse effects should not be ignored.

Methods : In this article we report a case of a 60-years old male with the diagnosis of Guillain-Barré Syndrome following administration of COVID-19 Sinopharm Vaccine.

Results : N/A

Conclusion : Though vaccination against COVID-19 have brought many benefits, one should consider various adverse effects of the vaccines, as they might result in severe reactions – like Guillain-Barré Syndrome.

Keywords : COVID-19, Sinopharm Vaccine, Guillain-Barré Syndrome, Case Report

Count: 539
Abstract ID: 493
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Investigating the effect of empathy type on the phenomenon of brain fog in post-Covid-19 fatigue

Submission Author: Mahnoosh Kamranvand

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Background and Aim : After the outbreak of covid-19 disease, one third of patients experience stable post-covid-19 symptoms, which include fatigue, cognitive complaints, sensorimotor symptoms, headache, insomnia, and post-traumatic stress disorder. Therefore, it is important to investigate the effective components in order to improve the mental health status of people with these symptoms, and the purpose of this research was to investigate the effect of cognitive and emotional empathy components on brain fog in post-Covid-19 fatigue.

Methods : The research is of the basic research type and the statistical population of the current research is people aged 20 to 50 who had a history of contracting the disease of Covid-19. The sample included 30 people. Smets Multidimensional Fatigue Measurement Questionnaire (FMI), Davis Empathy Questionnaire, Baron-Cohen Empathy Questionnaire, and Cognitive Abilities Questionnaire were used to collect information.

Results : The results related to the significant levels of Pearson's correlation showed that there is a correlation between the components. The findings related to multiple linear regression show that the adjusted coefficient of determination is equal to 0.382, which means that the proposed independent components, namely Davis's empathy, Cohen's empathy and multidimensional fatigue together account for 0.382% of the variance of the brain fog component. have predicted and the model was significant.

Conclusion : cognitive and emotional empathy brain fog as well as fatigue after covid-19 is explained, which suggests that this study in people with trauma experience, introduction and background for the design and use of interventions and special trainings to change in Beliefs before experiencing stressful events.

Keywords : Post-Covid-19 fatigue, cognitive empathy, emotional empathy, brain fog

Count: 540
Abstract ID: 625
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Post-Covid-19 Guillain-Barré Syndrome: A Case Report

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Background and Aim : Coronavirus disease 2019 affects the respiratory system. Neurological manifestations of COVID-19 are mainly thrombotic manifestations affecting the nervous system; however, demyelinating manifestation has been less defined. Although some recent studies have described the association between COVID-19 and Guillain-Barré syndrome. Here, we report one adult case of COVID-19 infection presenting with acute GBS.

Methods : A 34-year-old male with no known comorbidities, without any medication history, presented to the emergency department with complaints of weakness of bilateral lower limbs associated for 14 Day. Therefore , a diagnosis of GBS-acute inflammatory demyelinating polyneuropathy was made.

Results : The literature review highlights the co-existence of the SARS-CoV-2 infection and GBS and emphasizes its early diagnosis and treatment.

Conclusion : This study reinforces the idea that there is an association between COVID-19 infection and GBS via an autoimmune cross-reactivity mechanism. Close attention should be paid to neurologic complications such as GBS in COVID-19 patients, and early detection of symptoms and diagnosis are important.

Keywords : Guillain-Barré syndrome, neurological disease, neuropathy, covid-19

Count: 541
Abstract ID: 577
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

The Impact of COVID-19 on Cognitive Function: Exploring the Phenomenon of Brain Fog

Submission Author: Zahra Khanlari Serkani

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The COVID-19 pandemic has presented numerous challenges to global health, with a wide range of symptoms affecting infected individuals. Among these symptoms, a growing body of evidence suggests that COVID-19 may have an impact on cognitive function, leading to a phenomenon commonly referred to as "brain fog." This abstract aims to provide an overview of the existing literature on COVID-19-related brain fog, exploring its potential causes, manifestations, and implications. Brain fog refers to a state of cognitive impairment characterized by difficulties in concentration, memory recall, and overall mental clarity. Although brain fog is not unique to COVID-19 and can occur in various medical conditions or as a result of stress and fatigue, emerging research indicates that it may be more prevalent among individuals who have contracted the virus. Several factors have been proposed as potential contributors to COVID-19-related brain fog. These include direct viral invasion into the central nervous system (CNS), neuroinflammation triggered by the immune response, hypoxia resulting from respiratory complications, and psychological distress associated with the pandemic. However, further investigation is needed to establish definitive causal relationships between these factors and brain fog. The manifestations of brain fog in COVID-19 patients vary widely but commonly include difficulties in concentration and attention span, memory lapses or forgetfulness, slowed information processing speed, and challenges in multitasking. These cognitive impairments can significantly impact daily functioning and quality of life for affected individuals. Understanding the implications of COVID-19-related brain fog is crucial for healthcare professionals and policymakers alike. It highlights the need for comprehensive post-COVID care strategies that address not only physical recovery but also cognitive rehabilitation. Additionally, recognizing brain fog as a potential long-term consequence of COVID-19 emphasizes the importance of preventive measures such as vaccination campaigns aimed at reducing infection rates. In conclusion, while much remains unknown about the

underlying mechanisms and long-term effects of COVID-19-related brain fog, it is clear that this phenomenon warrants further investigation. By shedding light on its causes and consequences, this abstract aims to contribute to ongoing efforts in understanding and addressing this aspect of post-COVID recovery.

Keywords : COVID-19; SARS-CoV-2; coronavirus; virus infection; brain fog; cognitive impairment

Count: 542
Abstract ID: 13
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Corona vaccination in MS and NMO patients

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Background and Aim : Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Most people infected with the virus will experience mild to moderate respiratory illness and recover without requiring special treatment. To bring this pandemic to an end, a large share of the world needs to be immune to the virus. The safest way to achieve this is with a vaccine. Vaccines are a technology that humanity has often relied on in the past to bring down the death toll of infectious diseases. There are several COVID-19 vaccines validated for use by WHO. The first mass vaccination programme started in early December 2020. Infectious diseases are an important consideration in autoimmune conditions such as multiple sclerosis and NMO. Infective episodes may trigger relapses and significantly deteriorate the course of the disease. This review focuses on new evidence supporting the global immunization strategy for multiple sclerosis (MS) and NMO patients receiving recently available vaccines against severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) infection.

Methods : The design of the present study was a systematic review on people with NMO and Multiple sclerosis that received Corona vaccine. Search Persian language articles in Sid and Magiran databases, English language articles in Science direct, PubMed, Scopus, and Google Scholar databases without time limit until Jan 2022 with keywords related to " COVID-19", "NMO ", " Multiple sclerosis ", "Vaccination " done. Articles that examined the effect of exercise and exercise therapy on Parkinson's patients were selected.

Results : With the start of vaccination of certain groups, including MS and NMO patients, doubts have been raised about the side effects of this vaccine in general and its negative effects on the course of the disease of these loved ones. It should be noted that, like any other drug, side effects are possible for the Corona vaccine, but the important point is that these side effects are rare in the face of the risk of Covid 19 disease and its risks.

Conclusion : Studies show that in the meantime, the scales are completely in favor of universal vaccination, including for specific patients. Of course, you must consult your doctor about pre-

and post-vaccination procedures. Regarding the type of vaccine, despite the differences between the efficacy and side effects of different vaccines, it is important that all vaccines available in the Iranian market have an acceptable effectiveness in preventing severe disease and death. Clinical trials have also reported rare side effects that, despite being significant, have a very low prevalence of potential risks in the case of Covid 19 (especially in Iran with a high incidence of death and morbidity). Finally, vaccination is not mandatory, but (unless it is prohibited by the treating physician) in the current situation in the country may be the only way out of this dark impasse. Generally strengthen the evidence against a causal link between MS, NMO and vaccination. Recent consensus statements agree on the need to start vaccination early.

Keywords : COVID-19; NMO; Multiple sclerosis; Vaccination.

Count: 543
Abstract ID: 325
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

The relationship between Corona disease anxiety and sleep disturbances in medical staff: The mediating role of resiliency and cognitive flexibility

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Background and Aim : The COVID-19 pandemic's far-reaching impact on medical staff, has increased anxiety and numerous challenges that result in psychological issues like sleep disturbances, and even suicide. However, why are some individuals more vulnerable while others exhibit better resistance in these circumstances? Why are some less affected by external stressors, experience less anxiety, and have fewer sleep disruptions? In this context, the roles of two important psychological factors, resiliency, and cognitive flexibility, need to be explored. Therefore, this study aimed to investigate the relationship between corona disease anxiety and sleep disturbances in the medical staff and determine the mediating role of resiliency and cognitive flexibility.

Methods : This study employed a descriptive-analytical cross-sectional design, focusing on medical staff. The participants were associated with educational and treatment centers linked to Hamadan University of Medical Sciences, Iran in 2022. Purposive selection of primary COVID-19 treatment centers was utilized for sampling. A total of 180 participants were selected based on the number of variables (Howitt & Cramer, 2017). The study utilized validated tools, including the Coronavirus Anxiety Scale, Pittsburgh Sleep Quality Index, Connor-Davidson Resilience Scale, and Cognitive Flexibility Scale, for data collection. Ethical considerations were maintained throughout the data collection process.

Results : Path analysis was employed to test hypotheses. Analysis showed significant positive relationships between Corona disease anxiety and sleep disturbances (P = 0.001, ? = 0.438). Conversely, negative and significant associations were identified between resiliency with sleep disturbances (P = 0.001, ? = -0.257) and cognitive flexibility with sleep disturbances (P = 0.001, ? = -0.258).

Conclusion : The study delved into the relationships between various psychological factors among medical staff engaged in COVID-19 activities. It revealed that Corona disease anxiety had strong links with sleep disturbances, highlighting the widespread impact of heightened anxiety on mental health. The stress response triggered by anxiety led to disrupted sleep patterns. The research underscored the urgent need for tailored interventions and mental health support for healthcare workers combating pandemic challenges. Resilience was identified as a significant protective element that mitigated the adverse effects of Corona disease anxiety, and sleep issues. It acted as a buffer against the adverse psychological and physiological outcomes of heightened anxiety, suggesting that interventions to foster resilience could alleviate the mental health toll on healthcare professionals. Cognitive flexibility, a crucial cognitive trait, was discovered to mediate the connections between Corona disease anxiety, and sleep disturbances. This highlighted the role of adaptable thinking in influencing mental health outcomes during crises. The study's exploration of the bidirectional relationships between cognitive flexibility, neuroplasticity, and mental health outcomes offered potential for innovative intervention strategies. Ultimately, the intricate interplay among these factors underscored the importance of a comprehensive approach to addressing the mental health challenges faced by healthcare personnel during a pandemic. The study contributes to the growing knowledge base informing mental health strategies for healthcare workers, providing a basis for further research and targeted interventions. Prioritizing the health of frontline staff is still essential in light of COVID-19's continuing consequences and other potential future pandemics.

Keywords : Corona disease anxiety, sleep disturbances, medical staff, resiliency, cognitive flexibility

Count: 544
Abstract ID: 382
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Long-Term Consequences of COVID-19 on Sleep, Mental Health, Fatigue, and Cognition: Potential Risk of Dementia Among Survivors at Late Life

Submission Author: Armin Adibi

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Background and Aim : The global outbreak of coronavirus disease 2019 (COVID-19) caused by the SARS-CoV-2 virus has had far-reaching impacts on societies worldwide. The pandemic has led to considerable illness and loss of life, impacting multiple physiological systems. Persistent symptoms beyond the acute phase, lasting for months, are collectively known as post-COVID-19 Syndrome (PCS). Notably, COVID-19 has been linked to long-term effects on the brain and mental health, with higher incidences of neurological and psychological complications compared to other viral infections. This study aims to investigate depression, fatigue, sleep quality, and cognitive dysfunction, particularly working memory, in individuals with PCS compared to a healthy control group.

Methods : Participants were recruited between April and December 2021, with 45 COVID-19 subjects and 60 healthy subjects meeting the eligibility criteria. Detailed interviews, demographic information, and the Montreal Cognitive Assessment (MoCA) were collected. Two visual working memory tasks, Delayed Match-to-Sample (DMS) and n-back, were performed, along with self-report questionnaires: Beck Depression Inventory, Modified Fatigue Impact Scale, and Pittsburgh Sleep Quality Index.

Results : A total of 105 participants were enrolled, predominantly young adults. Cognitive impairment during the PCS phase was observed in 13.3% of the PCS group. Depression levels were significantly higher in the PCS group compared to controls, with 53.9% of PCS individuals

reporting depression. Additionally, sleep disturbance was reported in 53.9% of PCS individuals. Sleep latency and sleep duration were particularly affected. Working memory function showed no significant differences between groups.

Conclusion : The study highlights concerning long-term consequences of COVID-19 infection, particularly concerning cognition and mental health. Cognitive disruptions were most pronounced during the PCS phase, indicating COVID-19-induced damage that persists beyond the acute viral infection period. Participants experienced a decline in sleep quality following COVID-19 infection. Moreover, the PCS phase was associated with higher levels of depression. In the long term, both poor sleep quality and depression could serve as potential risk factors for neurological conditions like dementia. Further research is needed to comprehensively address these aspects and develop targeted interventions for affected individuals. In conclusion, this study highlights the higher prevalence of sleep disturbance, depression, and cognitive impairment in post-COVID-19 patients, with inflammation likely playing a significant role. Untreated depression and sleep disturbances may pose long-term risks for disorders like dementia. Understanding the underlying mechanisms is crucial for developing effective interventions and support for individuals recovering from the infection. Prospective longitudinal studies with larger and more diverse samples are warranted to confirm and expand upon these findings.

Keywords : Post-Acute COVID-19 Syndrome; COVID-19; Cognitive Dysfunction; Sleep; Depression; Working memory.

Count: 545
Abstract ID: 335
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Oral

Predictive value of interleukin-6 and inflammatory indexes for acute stroke development in hospitalized COVID-19 patients

Submission Author: Mohsen Sedighi

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Background and Aim : Stroke in COVID-19 infection observed in 0.1% to 2.5% of patients. Cytokine storm induced by interleukin-6 (IL-6) release in COVID-19 is a hallmark of disease that causes many complications. We sought to investigate relationship between inflammatory biomarkers and development of acute stroke in COVID-19 patients.

Methods : Demographic and clinical data of hospitalized COVID-19 patients from 2020 to 2022 were screened and reviewed. Extracted data including patient characteristics, laboratory biomarkers, and systemic inflammation indexes in patients with or without stroke were comparatively analyzed. Continuous variables were compared by Mann-Whitney U test or student's t-test based on the test of normality and categorical data were analyzed by Fisher's exact test. Logistic regression analysis was used to analyze the predictors of stroke development.

Results : Of the 1,753 COVID-19 patients, twenty patients (1.14%) developed acute stroke. We selected 80 patients without stroke as controls to compare data. Stroke patients were older (p=0.017), and cough (p=0.005), dyspnea (p=0.040), and cardiovascular diseases (p=0.049) were more common compared to controls. SpO2 in stroke patients showed a lower value (p=0.015), while systolic blood pressure was higher (p=0.020). Baseline IL-6 in stroke patients showed nearly a 3-fold increase when compared with controls (p=0.001). There was a significant difference between patients with and without stroke regarding decreased level of consciousness (p=0.001), ICU admission (p-0.001), length of stay (p=0.002), and mortality rate (p=0.001). In logistic regression, age (univariate [OR: 1.03, p=0.017], multivariate [OR: 1.04, p=0.019]), SpO2

(univariate [OR: 0.86, p=0.021], multivariate [OR: 0.82, p=0.040]), and IL-6 (univariate [OR: 3.62, p=0.001], multivariate [OR: 5.19, p=0.001]) were associate with stroke occurrence.

Conclusion : Our data showed that high IL-6 level at baseline is a strong predictor of stroke development in COVID-19 patients. Also, hypoxia and aging are associated with stroke occurrence.

Keywords : Stroke, Interleukin-6, COVID-19, Cytokine release syndrome

Count: 546
Abstract ID: 340
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Post-COVID- 19 survivors' strategies for improving occupational balance: A qualitative study

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Background and Aim : COVID-19 has caused some major changes in occupational patterns that form part of the individual's occupational identity. Due to debilitating symptoms, post-COVID-19 survivors with limitations in the occupational performance areas may experience occupational imbalance. The objective of this study was to investigate the methods employed by patients to engage in their daily activities for regaining occupational balance.

Methods : The study used an interpretive paradigm and conventional content analysis. An in-depth semi-structured interview was conducted with 11 patients who had been hospitalized due to COVID-19 in the past six months or less, along with their three primary caregivers residing in Tehran. The sampling method used was purposive and continued until conceptual saturation was reached. Participants with the most tremendous possible diversity in demographic variables were included. Data were analyzed using Corbin and Strauss's recommended Constant Comparative Analysis.

Results : The findings showed that patients used different strategies which included self-treatment based on others' recommendations, compensatory, fatigue prevention, and adaptive strategies to restore occupational balance.

Conclusion : As occupational therapists, we must understand post-COVID-19 survivors' perspectives on occupations and their preferred strategies. Also, findings confirm that occupational balance is a dynamic process that the adaptive capacities of the patients help to restore occupational balance.

Keywords : COVID-19, Occupational Balance, Qualitative, Strategy

Count: 547
Presentation Type: Oral

Application of virtual reality in the field of gynecology and obstetrics.

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Various methods have been proposed and used to reduce pain and anxiety in the field of gynecology and obstetrics .Pain and anxiety during natural childbirth and after cesarean section pain during diagnostic procedures such as colposcopy and other procedures affect the patient and the doctor and the treatment process. Labor is an important experience for women with both emotional and physical effects . The pain experienced during labor is considered a physiological condition as a result of uterine contractions to guide the fetus and other products outside the body The intensity of labor pain varies widely; a few women undergo labor suddenly with nonexistent or little pain, while on the other side, severe pain has been described . Pain perception during labor is affected by different factors, including physiological and psychological factors (fear, anxiety, and confidence), woman's position, genetic and clinical factors, levels of maternal education, and models of obstetric care (presence of a known caregiver) . Labor pain can affect the physical health of the mother, her emotional relationship with the child, and her thoughts about future births as well as the decline in labor satisfaction and comfort . Thus, labor pain management is crucial for both medical and human reasons. The number of non-pharmacological and complementary methods used to decrease labor pain has been increasing worldwide leading to the usage of new technological practices in this field . Virtual reality (VR) is a new technology that connects participants to an environment simulating reality that decreases perception of pain through diverting attention from the real world using computers or other devices . Virtual reality application has been expanded to different clinical areas in the last years, including physical rehabilitation, management of pain, and different psychiatric disorders . Virtual reality is a non-invasive, drug-free analgesic method, and easy to use . Many studies have evaluated the benefits of virtual reality use during normal delivery. A recent trial reported that showing fetal images to laboring women with virtual reality decreased perception of labor pain and anxiety levels . Moreover, another trial demonstrated a significant improvement in labor satisfaction in addition to the reduction in parturition stages duration among the virtual reality group. Virtual reality is an effective technique for reducing anxiety, increasing satisfaction, and improving pain management during normal labor. VR has been used to reduce pain and anxiety in various fields in gynecology and obstetrics. It also plays an important role in medical education.

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Presentation Type: Oral

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The effect of emotional focused therapy (EFT) on electroencephalography in clients of Tehran clinics

The aim of this study was to evaluate the effect of emotional focused therapy (EFT) on electroencephalography in clients referred to Clinics in Tehran. Method of research was semi experimental (Pre-test, Post-test, Follow-up) with control group. The study sampling was purposeful in which 30 clients were selected and randomly divided into two groups (15 client each). Experimental group received 9 sessions 90 minutes EFT once a week. Tools were 11 PSWQ questionnaire by Meyer& et al and electroencephalography in the PZ area at alpha and theta frequency. Covariance & Repeated measure analysis were used for data analysis . The result of analysis in pre, post test indicated the significant effect of EFT on electroencephalography of clients. Also the result of the findings in group and time effect showed that in worry symptoms and electroencephalography were significant difference between experimental and control group in follow up test.

Key Words: Emotional focused therapy(EFT), electroencephalography, clients

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Presentation Type: Poster

The effect of Cognitive-Motor Training (Neurolight) on the balance and executive functions of the elderly

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The purpose of this study was to design, develop, and evaluate the effectiveness of a set of cognitive physical exercises using the Neurolight system to improve core executive functions at the end of adulthood and early elderly ages. We designed the Neurolight system as a set of IoT devices that can present cognitive tasks using sound and light while receiving users' feedback through their touch by hand or foot. The theoretical basis of designing this system was based on the research literature which indicated that by combining physical and cognitive exercises, its effectiveness in improving executive functions can be improved. In this regard, by designing a smart training system, executive functions of working memory and inhibition were combined with physical challenges of aerobic, coordination, and balance. To evaluate the effectiveness of the Neurolight system, 36 people in the age range of 60 to 70 years were randomly divided into three training groups (a cognitive motor training group using Neurolight, a computer cognitive training group using Maghzineh, and a control group). The N-back, Timed Up & Go, and Stroop tests were used in the pre-test and post-test stages to evaluate the working memory, motor performance (balance), and the inhibitory control. For statistical analysis, the covariance test was used using SPSS software. The results showed that although both cognitive and motor cognitive exercises improved cognitive components, but the type of improved cognitive components were different. Compared to the cognitive training group and the control group, the cognitive motor training using the Neurolight system was significantly improved working memory ($F_{1,32}=63.7$, $P=0.0001$, $\eta^2=0.79$, interference score ($F_{2, 32}=3.79$, $P=0.03$, $\eta^2=0.19$), and balance ($F_{2, 32}=6.09$, $P=0.006$, $\eta^2=0.27$). In the cognitive training group, only the interference time scale improved significantly ($F_{2, 32}=3.79$, $P=0.03$, $\eta^2=0.19$) compared to the control group. These results can be considered as preliminary evidences of the effectiveness of the combination of cognitive and motor exercises with the Neurolight system. In order to examine the effectiveness of this method, more research is required using different samples and different age groups and using other cognitive measurements.

Keywords: Cognitive Motor Exercises, Neurolight, Cognitive Rehabilitation. Executive Functions