Presentation Type: Oral

Mental Development in Children with Visual Impairment

Elham Shirazi, M.D.

Board of Child and Adolescent Psychiatry, Mental Health Research Center, Psychosocial Health Research Institute, Department of Psychiatry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran, shirazi.e@iums.ac.ir

Abstract
Visual impairment affects all areas of development. These children have 1-2 years delay in all developmental aspects in preschool period. Delay in one area of development has secondary cumulative effect on other areas of development. Visually impaired children have delay in attachment formation because face recognition, face emotions, social smile, and eye to eye contact are important in developing affective bonds.

Repeated joint reference and naming objects by parents, which are important in language development, cannot be established in the blind infant. They use multiword phrases before the use of noun labels, continue echolalia, and have delay in use of pronouns and spatial relational words.

Blind children are deprived of imitative learning and cannot see and learn adaptive skills through observation. Social skills are highly visually depended and early social interactions, nonverbal social cues, and body language are not available to visually impaired children.

Visual stimulation is a motivator to explore and interact with the environment and its lack leads to delay in crawling, walking, reaching, grasping, and bilateral hand coordination. Limited mobility can limit the separation and individuation process and autonomy formation.

Key words: Child, development, visually impaired

Presentation Type: Oral

The importance of consciousness for free will

Mohammad Ghadiri vasfi

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

The secrets of human evolution started by bipedalism followed by huge changes and ended with Sapiens. The most unresolved matters are two hooked concepts: consciousness and free will or determinism. Before joining two hemispheres, sapiens had double or ununified consciousness.

Free will/determinism gained meaning with the appearance of Sapiens while they started making community as well as culture and collective brain. By learning, they were impressed by huge specified networks which governed their brains. The vital information processing was skilled and every module among thousands, had its rules and specific location. One of the most important output of this biological machine was consciousness with low or high cognitive errors.

Considering accumulation of more knowledge and experiences, more modules connected and complex behaviors and abstract concepts of mental status including judgment and insight emerged.

From this point of view, more knowledge and experiences had a positive impact on problem solving and decision making; as a result of mentioned neuroplasticity, humankind acquired different competences while they faced problems or crises.

Key words: Consciousness, Free will/determinism, Neuroplasticity

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Presentation Type: Oral

Cognitive rehabilitation for improving cognitive functions and reducing the severity of depressive symptoms in adult patients with Major Depressive Disorder: A systematic review and meta-analysis of randomized controlled clinical trials

Saba Mokhtari1, Asieh Mokhtari2, Farah Bakizadeh3, Alireza Moradi4,5, Mohammadreza Shalbafan6,7*

1. Department of Psychiatry, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
2. School of Allied Medical Sciences, Iran University of Medical Sciences, Tehran, Iran
3. Department of Psychology, University of Tehran, Tehran, Iran
4. Department of Clinical Psychology, Kharrazmi University, Tehran, Iran
5. Institute for Cognitive Sciences Studies, Tehran, Iran
6. Mental Health Research Center, Psychosocial Health Research Institute (PHRI), Department of Psychiatry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
7. Brain and Cognition Clinic, Institute for Cognitive Sciences Studies, Tehran, Iran

Presenting author: Dr Mohammadreza Shalbafan

E-mail: Shalbafan.mr@iums.ac.ir

Introduction: Nearly 40% of patients with Major Depressive Disorder (MDD) have been found to experience cognitive impairment in at least one domain. Cognitive impairment associated with MDD is disproportionately represented in patients that have not fully returned to psychosocial functioning. As awareness regarding cognitive dysfunction in MDD patients grows, so does the interest in developing newer treatments that specifically address these deficits.

Method: In the present study, we conduct a systematic review of controlled randomized clinical trials that used cognitive training and remediation interventions for improving cognitive functions and reducing symptom severity in adult patients with MDD. We selected studies published before March 2022 using search databases including PubMed, ScienceDirect, Scopus, and Google scholar. For conducting the meta-analysis, standard differences in means with the random effect model and with a 95% confidence interval of change in outcome measures from baseline to post-intervention between the cognitive rehabilitation and the control groups were calculated.

Results: The database search resulted in identifying 756 studies of interest, which ultimately 15 studies with 410 participants in the cognitive rehabilitation group and 339 participants in the control group were included. The meta-analysis of the data extracted from these studies, shows a moderate and significant effect on the executive function (d= 0.59 (95% CI, 0.25 to 0.93) p-value= 0.001, I^2= 15.2 %), verbal learning (d= 0.45 (95% CI, 0.12 to 0.78) p-value= 0.007, I^2= 0.00%), and working memory (d= 0.41 (95% CI, 0.18 to 0.64) p-value< 0.001, I^2=33 %) of MDD patients. Although, there were no significant difference between intervention and control group in attention (d= 0.32 (95% CI, -0.01 to 0.66) p-value= 0.058, I^2= 0.00%) or depressive symptoms.

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Conclusion: This systematic review and meta-analysis indicate that cognitive rehabilitation is an effective intervention for the executive function, verbal learning, and working memory of MDD patients. Due to the importance of these neuropsychological deficits in day-to-day life and the core symptoms of MDD, cognitive rehabilitation should be considered an important part of treating MDD. Further research in this area and concentrated on these particular deficits is warranted.

Key words: Cognitive Function, Major Depressive Disorder, Systematic Review, Meta-Analysis, executive function, verbal learning, working memory

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Presentation Type: Poster

Oxidative stress and neuroinflammation: molecular targets of α-bisabolol (α-BSB) in protecting against pentylenetetrazole (PTZ)-induced seizures in rats.

Donya Nazarinia [a*], Paria Hashemi [b], Nahid Aboutaleb [c,d], Ahmadreza Moslehi [e]

a Department of physiology, School of Paramedical Sciences, Dezful University of Medical Sciences, Dezful, Iran
b Cellular and Molecular Research Center, Research Institute for Health Development, KurdistanUniversity of Medical Sciences, Sanandaj, Iran
c Physiology Research Center, Iran University of Medical Sciences, Tehran, Iran
d Department of Physiology, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran
e Department of Medical Physiology, School of Medicine, Dezful University of Medical Sciences, Dezful, Iran

Corresponding authors: Donya Nazarinia, Department of Physiology, School of Paramedical Sciences, Dezful University of Medical Sciences, Dezful, Iran, Email address: **Nazari.n@dums.ac.ir**

Background: The pathophysiology of epilepsy involves multiple events such as inflammation and oxidative stress which will lead to neuronal death and cognitive deficits. The α-bisabolol(α-BSB) is a monocyclic sesquiterpene alcohol found in various plants and mainly in Matricaria chamomilla, which exerts antioxidant, anti-inflammatory,andanti-apoptotic activities. Here, we conducted present study to evaluate its neuroprotective effects against pentylenetetrazole (PTZ)-induced seizures in rats.

Methods: Animals were treated with α-BSB (50,100mg/kg/day,orally)or vehicle (3%tween80) one hour before PTZ administration for ten days. Y-maze and passive avoidance were utilized to evaluating cognitive and memory performance. The expression of pro-inflammatory cytokines and oxidative stress factors were measured using the enzyme-linked immunosorbent assay (ELISA).

Results: outcome of this work shows that α-BSB at the dose of 100 mg/kg may exert neuroprotective effects by mitigating seizures, oxidative stress, and neuroinflammation, and ameliorates memory and anxiety disorders in the PTZ-induced seizure rats.

Conclusion: Collectively, α-BSB at the dose of 100 mg/kg can be considered as a valid therapeutic agent to reduce PTZ-induced seizures in rats

Count: 1
Abstract ID: 46
subject: Cognition: Learning and Memory
Presentation Type: Oral

Elevation of CSF microvesicles containing Fractalkine was preceded spatial memory impairment induced by amyloid beta administration

Submission Author: Leila KarimiZandi

Leila KarimiZandi[1], Maryam Zahmatkesh[2], Gholamreza Hassanzadeh[3], Soheila Hosseinzadeh[4]

1. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
4. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : The chemokine Fractalkine (CX3CL1) expresses on neurons, and has a neuromodulatory role in cognitive function and synaptic plasticity. It signaling impairment have been reported in Alzheimer disease. Neuronal cell cross-talks occur through the release of Microvesicles (MVs) in physiological or pathological situations. Microvesicles released in cerebrospinal fluid (CSF) may provide a valuable footprint of brain changes. Little information is available regarding the release of fractalkine-positive MVs (CX3CL1+ -MVs) in the nervous system

Methods : Cognitive impairment was induced by bilateral injection of amyloid-beta (Aβ) into the cerebral ventricles. Flow cytometry was used to elucidate the presence of CX3CL1+ -MVs. The hippocampal TNF-α as an inflammatory factor was assessed by immunohistochemistry

Results : The Aβ induced spatial memory impairment after two weeks, verified by a decrease in the escape latency in Morris water maze test. The Aβ increased the percent of the positive area for TNF-α staining. The CSF levels of CX3CL1+ -MVs, was increased 2 and 7 days after Aβ injection

Conclusion : The Aβ increased the TNF-α staining and provided an inflammatory context to facilitate the MVs release. Increase of fractalkine-positive microvesicles preceded the cognitive impairment, this could introduce CX3CL1+ -MVs as a potential biomarker in the early diagnosis of Alzheimer's disease.

Keywords : Alzheimer's disease, Chemokine, Fractalkine/ CX3CL1, Microvesicles, Morris water maze

Count: 2
Abstract ID: 111
subject: Cognition: Learning and Memory
Presentation Type: Oral

Differential effects of unilateral patterned electrical stimulation of mouse locus coeruleus on cell proliferation in the dorsal dentate gyrus

Submission Author: Zohreh Tavassoli

Zohreh Tavassoli[1], Yaghoub Fathollahi[2], Mohammad Javan[3], Narges Hosseinmardi[4]

1. PhD candidate, Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Professor, Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. professor, Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Professor, Department of Physiology, Faculty of Medical Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : The dorsal hippocampus has been shown to have axons terminating from the locus coeruleus (LC) that release dopamine along with norepinephrine. Considering the firing patterns (tonic and phasic) of LC neourons and the difference in neurogenesis between the dorsal and ventral hippocampus, the effects of unilateral patterned electrical stimulation of mouse locus coeruleus on cell proliferation in the dorsal dentate gyrus were studied.

Methods : In this study, C57BL/6 mice were used. A tripolar stainless steel electrode was implanted into the LC a head socket was fitted. Upon recovery from surgery, the animal is connected to a miniature buffer head stage for electrical stimulation. LC electrical stimulation was conducted in two protocols (1 and 4 days) using a tonic mode presented at a frequency of 1 Hz (pulses of 250 μS duration and 700 μA) and phasic mode (pulses of 250 μS duration and 700 μA delivered in 0.25-s bursts of six pulses, burst frequency 24 Hz) for 20 minutes. The animals were perfused with paraformaldehyde 48 hours after the last stimulation. For immunofluorescence, brains were sectioned coronally (at 10 μm) through the entire longitudinal axis of the hippocampus. As a marker of proliferation, Ki67 was used in this study.

Results : Data analysis showed that applying a single electrical stimulation to the locus coeruleus caused a significant difference in cell proliferation in the dorsal hippocampus. Thus, the group that received tonic stimulation showed a significant decrease in Ki67+ cells in the dorsal hippocampus, while the group that received phasic stimulation showed a significant increase in Ki67+ cells in the dorsal hippocampus.

Conclusion : It is concluded that LC stimulation by phasic pattern, not tonic, induces more cell proliferation in the dDG. Considering the enhancing effect of the novel and complex environments on the number of new neurons in the hippocampus, in our opinion, the effect of LC electrical stimulation by phasic pattern on cell proliferation maybe imitate a situation like the effect of the novel and complex environments.

Keywords : LC, Phasic and Tonic activity pattern, neurogenesis

Count: 3
Abstract ID: 159
subject: Cognition: Learning and Memory
Presentation Type: Oral

Bicuculline Improved Passive Avoidance Memory Impairment in the Local Model of Demyelination in Rat Hippocampus

Submission Author: Fereshteh Pourabdolhossein

Fereshteh Pourabdolhossein[1], Maryam Sadat Mirhadi[2], Atena Nazari[3], Samaneh Dehghan[4], Mohammad Javan[5]

1. Physiology Departments, School of Medicine, Babol University of Medical Sciences, Babol, Iran
2. Student Research Committee, Babol University of Medical Sciences, Babol, Iran
3. Neuroscience Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
4. Stem Cell and Regenerative Medicine Research center, Iran University of Medical Sciences, Tehran, Iran
5. Physiology Departments, School of Medicine, Tarbiat Modares University, Tehran -Iran

Background and Aim : Cognitive impairment and memory deficit are common features in multiple Sclerosis patients. The mechanism of memory impairment in MS is unknown, but neuroimaging studies suggest that hippocampal demyelination is involved. Here, we investigate the role of GABA A receptor on passive avoidance memory in the local model of hippocampal demyelination.

Methods : Demyelination was induced in male Wistar rats by bilaterally injection of lysophosphatidylcholine (LPC) 1% into the CA1 region of the hippocampus. The treatment groups were received daily intraventricular injection of a selective GABA A antagonist, bicuculline (0.05 µg/2µl/animal) or a selective GABA A agonist, muscimol (0.1 µg/2µl/animal) 3 days after LPC injection. Passive avoidance memory was evaluated in all groups by shuttle box. Luxol fast blue as well as hematoxylin and eosin staining were performed to assess demyelination extent and cells infiltration respectively. Hippocampal tissue was used for gene expression analysis by qPCR for BDNF, NGF, MBP, IL1β, IL17, NFkb, iNOS, Olig2 genes.

Results : Behavioral study revealed that LPC injection in the hippocampus impaired passive avoidance memory function. Animals treated with bicuculline improved memory function; however, muscimol treatment had no effect compared to LPC group. Histological study confirmed that demylination extent in LPC group was maximal. Bicuculline treatment significantly reduced demyelination extension. H&E results showed that bicuculline reduced inflammatory cell infiltration in the lesion site however muscimol administration did not show significant alteration.

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The expression level of inflammatory cytokines such as IL1β, IL17, NFkb and iNOS were significantly increased in LPC group which was effectively reduced by bicuculline treatment but muscimol treatment did not significantly change the level of those genes. We found that the level of BDNF and NGF as protective CNS growth factors decreased in LPC group and bicuculline treatment significantly enhanced their expression compared to LPC and control groups. MBP and Olig2 level as an index of remyelination were significantly diminished in LPC group and bicuculline treatment augmented their expression level however muscimol did not change these factors.

Conclusion : Bicuculline improved memory function and myelin repair through inhibition of inflammatory factors and enhancement of BDNF and NGF in the LPC-induced hippocampal demyelination. We conclude that disruption of GABAergic homeostasis in hippocampal demyelination context may be involved in memory impairment with the implications for both pathophysiology and therapy.

Keywords : Demyelination, Avoidance Memory, Inflammation, Bicuculline, Remyelination

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Count: 4
Abstract ID: 179
subject: Cognition: Learning and Memory
Presentation Type: Oral

Effects of chronic hypoxia on the expression of seladin-1/Tuj1 and the number of dark neurons of hippocampus.

Submission Author: Simin Mahakizadeh

Simin Mahakizadeh[1], Tahmineh Mokhtari[2], Fatemeh Navaee[3], Mahnaz Poorhassan[4], Armin Tajik[5], Gholamreza Hassanzadeh[6]

1. Department of Anatomy, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran
2. CAS Key Laboratory of Mental Health, Institute of Psychology, Beijing, China.
3. Department of Anatomy, School of Medicine, Shahidbeheshti University of Medical Sciences, Tehran, Iran
4. Department of Anatomy, School of Medicine, Shahidbeheshti University of Medical Sciences, Tehran, Iran
5. Student Research Committee, Alborz University of Medical Sciences, Karaj, Iran
6. Department of Anatomy, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : There are evidences showing the relation between chronic hypoxia and Alzheimer's disease (AD) as a metabolic neurodegenerative disease. This study was designed to evaluate the effects of chronic hypoxia on factors which characterized in AD to introduce a new model of AD-dementia.

Methods : Twenty-four male rats were randomly divided in three groups: Control group (Co), Sham group (Sh), Hypoxia induction group (Hx, exposed to hypoxic chamber [oxygen 8% and nitrogen 92%] for 30 days, 4 h/day). Spatial learning and memory were analyzed using the Morris water maze task. At day 30 after hypoxia period, animals were sacrificed and serum was gathered for pro-inflammatory cytokines (interleukin-1β and tumor necrosis factor) measurements and brains were used for molecular and histopathological investigations.

Results : According to behavioral studies, a significant impairment was seen in Hx group ($P<0.05$). TNF-1 and IL-1B showed a significant enhanced in Hx group comparing with Co group and Sh group ($P<0.05$). As well, the gene expression of seladin-1, Tuj1 and the number of seladin-1+, Tuj1+neurons significantly decreased and also the mean number of dark neurons significantly increased in CA1 and CA3 regions of hippocampus.

Conclusion : In this study, a new model of AD was developed which showed the underlying mechanisms of AD and its relations with chronic hypoxia. Hypoxia for 30 days decreased seladin-1, Tuj1 expression, increased the number of dark neurons, and also induced memory impairment. These results indicated that chronic hypoxia mediated the dementia underlying AD and AD-related pathogenesis in rat.

Keywords : Hypoxia. Alzheimer's disease. Dementia. Inflammation. seladin-1. Memory impairment

Count: 5
Abstract ID: 188
subject: Cognition: Learning and Memory
Presentation Type: Oral

Peripheral inflammatory pain impairs p-Trkb/Trkb/bdnf signaling pathway in the hippocampus

Submission Author: Mola Mohammadi

Mola Mohammadi[1], Jalal Zaringhalam[2], Sarieh Ghasempour[3]

1. Physiology Department, School of Medicine, Iranshahr University of Medical Science, Iranshahr, Iran
2. Physiology Department, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Physiology Department, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : With approximately 20% to 30% of the world population suffer from chronic pain. two thirds of the chronic pain patients have learning and memory impairment. It has been suggested that chronic pain impairs p-Trkb/Trkb/bdnf signaling pathway, but there is poor evidence to learning and memory impairment. Therefore, the aim of the study is the Investigation of the relationship between p-Trkb/Trkb/bdnf signaling pathway variation with hyperalgesia, spatial memory during persistent peripheral inflammation

Methods : Animals were randomly distributed to 2 groups, the groups were as including, first group as control group second and third groups are respectively as CFA7 and CFA21 (received 100 µL CFA on 0 day and assessed on 7 and 21 days of study), fourth and fifth groups as Minocyclin7 and Minocyclin21(received 100 µL CFA on 0 day+40mg/kg/day minocycline until day 7 and 21 of study). Thermal hyperalgesia and the spatial memory was assessed using the radiant heat and Morris water maze respectively

Results : our results that CFA-induced inflammatory pain impaired spatial learning and memory associated with reduce p-Trkb/Trkb ratio and BDNF expression and apoptotic cell death in the hippocampus during first week of study. Also administration of Minocycline can effectively improve pain-induced hippocampal p-Trkb/Trkb ratio and BDNF expression after CFA injection associated with improve spatial memory impairment

Conclusion : Therefore, we can suggest that peripheral inflammation impairs hippocampal p-Trkb/Trkb/bdnf signaling pathway, which in turn impaired cognitive performance.

Keywords : cognition; memory; pain; inflammation; BDNF

Count: 6
Abstract ID: 468
subject: Cognition: Learning and Memory
Presentation Type: Oral

Investigation of protective effects of olanzapine on impaired learning and memory, and synaptic plasticity in a rat model of Alzheimer's disease

Submission Author: Alireza Komaki

Alireza Komaki[1], Parsa Amiri[2], Somayeh Komaki[3], Samaneh Safari[4], Ebrahim Abbasi[5]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
2. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
3. Department of Physiology, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
4. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
5. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Alzheimer's disease (AD) is a neurodegenerative disorder characterized by the accumulation of beta-amyloid (Aβ) peptides outside the neuronal cells. Evidence has suggested a critical role for oxidative stress in AD pathogenesis and progression. Therefore, antioxidants may reduce neurotoxicity caused by Aβ and reduce cell death. Previous studies have shown that olanzapine (OLZ) has antioxidant and neuroprotective effects. In the present study, we examined the protective and therapeutic effects of OLZ on an animal model of AD induced by Aβ using electrophysiological and behavioral methods.

Methods : In this study, 50 adult male Wister rats weighing 250-280 g were used. The rats were randomly assigned to five groups (n=10 rats/group): the control group that consumed an ordinary diet, the sham group that received phosphate-buffered saline as the solvent of Aβ via an intracerebrovascular (ICV) injection, the AD model group that received Aβ via an ICV injection to induce AD, the positive control group that consumed OLZ (10 mg/kg) by gavage for two months, and the pretreatment + treatment group that consumed OLZ for one month before and one month after the induction of AD. Morris water maze (MWM), Barnes maze (BM), passive avoidance learning (PAL), elevated plus maze (EPM), and novel object recognition (NOR) tests were used to examine learning and memory in rats. After behavioral study, in vivo electrophysiological recordings were performed to quantify the excitatory postsynaptic potential (EPSP) slope and population spike (PS) amplitude in the hippocampal dentate gyrus. Long-term potentiation (LTP) was created by a high-frequency stimulation of the perforant pathway.

Results : ICV injection of Aβ, to create a model of AD, reduced memory in behavioral tests, including NOR, PAL, MWM, BM, and EPM. The use of OLZ in all forms improved memory and learning in behavioral tests. Following LTP induction, the EPSP slope and PS amplitude were significantly diminished in Aβ-injected rats, compared with sham and control rats. OLZ treatment of Aβ-injected rats significantly attenuated these decreases, suggesting that OLZ reduces the effects of Aβ on LTP.

Conclusion : Our results suggest that OLZ could recuperate the learning and memory and synaptic plasticity impairment following Aβ injection and OLZ consumption may lead to an improvement in AD-induced cognitive dysfunction. Thus, OLZ has a preventive and therapeutic function on AD and can be considered as a suitable drug option.

Keywords : Alzheimer's disease; Aβ; Olanzapine; Memory and Learning; Long-term potentiation; Neuroprotective

Count: 7
Abstract ID: 376
subject: Cognition: Working Memory
Presentation Type: Oral

Working Memory enhancement of pilots using electrical stimulation

Submission Author: Elnaz Hamze

Elnaz Hamze[1], Zahra Bahmani[2], Mohammad Rostami[3]

1. Department of Biomedical Engineering, Faculty of Electrical and Computer Engineering, Tarbiat Modares University, Tehran, Iran
2. Department of Biomedical Engineering, Faculty of Electrical and Computer Engineering, Tarbiat Modares University, Tehran, Iran
3. Department of Communication, Faculty of Electrical and Computer Engineering, Tarbiat Modares University, Tehran, Iran

Background and Aim : Working memory (WM) is of paramount importance in executive functions and comprises two distinct domains of non-verbal and verbal WM (VWM). WM capacity is limited, and extensive research has been conducted to enhance it. Capacity augmentation of VWM has a vital role in the performance optimization of users of complex systems such as pilots. VWM is very important for pilots since, in addition to guiding the aircraft, they have to memorize messages from air traffic control and immediately repeat them, and afterward perform the required tasks. Recent studies employing Non-invasive brain stimulation reveal significant effects of transcranial direct current stimulation (tDCS) in the left dorsolateral prefrontal cortex (LDLPFC) on visual VWM. However, little is known about the impacts of tDCS over the LDLPFC during an auditory VWM task, performed by the pilots. Therefore, the goal of this study is to determine whether tDCS over the LDLPFC modulates the auditory VWM of pilots.

Methods : In this study, ten pilots volunteered to participate in an hour-long auditory task under three conditions: Baseline (without stimulation), Sham (inactive stimulation), and tDCS (anodal stimulation). The stimulation was applied before starting the task with a stimulation intensity of 2mA. The duration time of the electrical stimulation was 30 seconds at Sham and 10 minutes at tDCS condition. The task was conducted in six stages, progressing to more difficult. The task started with the easiest stage in which the voice included four characters and progressed to the last and most difficult one with fourteen characters (two increments per stage). In each stage, half of the characters were numbers and the other half were alphabet letters. Pilots had to memorize voice messages including different characters, then they had to repeat the played message. In each condition, 30 voices were played in the pilot's headset.

Results : The subject's responses were recorded by MATLAB and the number of correct remembered characters were extracted by organizing the recorded data. Statistical hypotheses were tested using across-subject (conditions and stages) and within-subject approaches. Results of the Wilcoxon signed-rank and Friedman test showed that 2mA anodal tDCS of the LDLPFC enhanced the pilot's response performance in comparison to other conditions in the last stages which are more difficult (Wilcoxon signed-rank: 〖Pvalue〗_(tDCS,Baseline)=0.0039 and 〖Pvalue〗_(tDCS,Sham)=0.0234 for stage 4, 〖Pvalue〗_(tDCS,Baseline)=0.0078 for stage 5, 〖Pvalue〗_(tDCS,Baseline)=0.043 and 〖Pvalue〗_(tDCS,Sham)=0.0449 for stage 6 and Friedman test: Pvalue=0.0028 for stage 4, Pvalue=0.0084 for stage 5 and Pvalue=0.0498 for stage 6). Furthermore, Significant enhancement of VWM capacity was obtained by considering all stages (Wilcoxon signed-rank: 〖Pvalue〗_(tDCS,Baseline)=4.6791e-5, 〖Pvalue〗_(Sham,tDCS)=4.3532e-4 and Friedman test: Pvalue=2.4992e-5).

Conclusion : The present study provided one of the first evidence of pilot's cognitive abilities augmentation by examine the effects of tDCS on the LDLPFC area of the pilot's brain. We found that anodal stimulation of the LDLPFC, significantly enhanced pilot's auditory VWM performance. Enhancement of the pilot's performance revealed that LDLPFC had a causal role in modulating VWM. This results can be beneficial for finding a profounder insight into neural mechanism of WM and its usage for human augmentation.

Keywords : Verbal Working Memory; Auditory task; Transcranial direct current stimulation; Dorsolateral prefrontal cortex; Pilot.

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

Submission Author: Negar Bonyadi

Negar Bonyadi[1], Neda Dolatkhah[2], Maryam Hashemian[3]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.

2. Physical Medicine and Rehabilitation Research Center, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran.

3. Department of Biology, School of Arts and Sciences, Utica College, Utica, USA

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 ageing population. Along with the aging of the population worldwide, cognition-related diseases are progressively rising. These disorders, such as mild cognitive impairment (MCI), dementia, and Alzheimer's disease (AD) significantly increase the burden of social and economic health for most communities. Numerous studies have shown a relationship between lifestyle influences and cognitive function in older adults. A considerable amount of data has specified that nutrition is related to age-associated disorders and longevity. The main objective of the current systematic review was to evaluate the efficacy of whole berries or a berry-based products (e.g. smoothie, juice) or berry extract/capsule consumption in adult or old subjects with healthy cognitions or MCI.

Methods : In this randomized controlled trials study, 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). The investigation question was structured based on the PICOS (participants, interventions, comparators, outcomes, and study design) criteria as follows: Do berry-based dietary supplements or foods affect at least one recognized cognition related outcome in adult or old subjects with healthy cognitions or 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: 9
Abstract ID: 84
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

Time-place maze: a new device for concurrent assessment of time and place perceptions in rats

Submission Author: Fazel Isapanah Amlashi

Fazel Isapanah Amlashi[1], Ali Ashkbari[2], Mehrdad Jahanshahi[3]

1. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
2. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
3. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran

Background and Aim : Behavioral challenges for studying functions of place cells and time cells of the hippocampus focus on the perception of place or time separately and assessing the relationships between them are not noted. In this regard, we design the time-place maze (TPM) to provide the basis for such a study. In this maze, the rats are highly involved in integrating their perception of place and time to solve the challenge.

Methods : TPM protocol was designed to guide the implementation of training, screening, and main phase step by step. Six adult male Wistar rats (weighing> 230±20 g) were used in the experiment. The apparatus consists of four major parts: start box (65*60*60 cm), L-shaped bridge 1 (40*15*60 cm), L-shaped bridge 2 (90*55*60 cm), and reward box (65*60*60 cm). In the start box, there is a restricted area (starting point) with a guillotine-like door (time-door) at the front wall. The bridges have guillotine doors at the beginning (first door) and the end (second door). Two kinds of tests were used: 1) bridge 1 test, the first doors of both bridges and only the second door of bridge 1 are open, after placing the rat in the starting point, the time-door opens without any delay; 2) bridge 2 test, the first doors of both bridges and only the second door of the bridge 2 are open, after placing the rat in the starting point, the time-door opens after a 3s delay. The logic of the maze consists of two relationships: the short opening time of the time-door is related to the shorter path (bridge 1), and long opening time is related to the longer path (bridge 2). In the training phase, the rats were trained in four sessions to learn the logic of the maze, and whenever a rat failed a test, the operators gave feedback called correction. Second, they were screened via randomized test to include them in the main phase. In the main phase, the rats passed 100 randomized tests within ten sessions to assess their behaviors toward the maze challenge.

Results : Six rats were entered the training phase of the experiment and four of them successfully passed the screening phase. The mean number of corrections during the training phase was 16.25

times per rat and more for the bridge 2 test. The range of success rate in 100 randomized tests was 73-82% in the experiment. The total number of corrections in the main phases had a significant relationship with the success rate in the main phase (p-value = 0.019). All the rats were more successful in the bridge 1 test than in bridge 2 tests (170 VS. 136; p-value = 0.038).

Conclusion : The findings of the experiment showed that the TPM is applicable in animal research. TPM can open a new window into behavioral neuroscience research by letting the researchers study a behavior about the integrated perception of dimensions from a new view that was not available before.

Keywords : Behavioral neuroscience, Time cell, Place cell, Hippocampus, Maze

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Count: 10
Abstract ID: 406
subject: Cognition: Neurolinguistics
Presentation Type: Oral

Verbal fluency performance of Arabic- Persian Bilingual and Persian monolingual Elementary Students in Ahvaz City

Submission Author: BEHNOOSH TAHANZADEH

Behnoosh Tahanzadeh[1], Mehrnoosh Farzi sargholi[2], Negin Aghaei[3], Zahra Monjezi[4], Mehdi Askari[5], Armin Aghapour zangeneh[6], Majid Soltani[7]

1. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
2. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
3. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
4. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
5. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
6. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
7. Department of Speech Therapy, School of Rehabilitation sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background and Aim : The verbal fluency refers to the ability of produce fluent speech and in fact, it measures the ability to organize and generate instant responses based on a specific rule for the recovery of verbal information over a limited period. Verbal fluency tests are often used to examine lexical and semantic knowledge of children as well as executive functions. The aim of the present study is studying the verbal fluency skill among Arabic- Persian Bilingual and monolingual Elementary Students.

Methods : A cross-sectional and descriptive-analytic study was conducted on the 47 Arabic- Persian Bilingual (L1 was Arabic) and 104 Persian monolingual elementary students. They selected from the fourth and sixth-grade students of the non-profit schools in Ahvaz. Students conducted both phonological (m/a/k) and semantic (animals/fruits/ clothes) verbal fluency tasks. The response time for each question was one minute. The number of produced words was calculated as the score.

Results : Findings indicated a significant differences between bilingual and monolingual students in semantic verbal fluency tasks according to independent T test ($p < 0.017$). in contrast, the results of comparisons in phonological verbal fluency tasks was not significant ($p > 0.22$). The verbal fluency skill was an age related ability especially among bilinguals.

Conclusion : Bilingual people had a quantitative and qualitative difference with monolinguals. The need to simultaneously retrieve examples of the target language and also inhibit control the language that is not intended to be tested may led to fewer correct answers for bilinguals than monolinguals as seen in the semantic tasks of this study. Improvement of lexical knowledge by increasing age and education shows a positive impact on bilingual functions and decrease the Functional differences with monolinguals. The results of this study help to the extension of our knowledge about language processing in bilinguals, and it will also underlie future research to find normative data on the performance of bilingual and multilingual children.

Keywords : verbal fluency, Bilingualism, Arabic-Persian, Execution Function, Language

Count: 11
Abstract ID: 318
subject: Cognition: Neurolinguistics
Presentation Type: Oral

ANN-EAM: An Artificial Neural Network-Evidence Accumulation Framework for Modeling of Human Lexical Decision-Making

Submission Author: Arash Dadras

Arash Dadras[1], Mahvash Siavashpour[2], Jamal Amani Rad[3]

1. Department of Cognitive Modeling, Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran.
2. Faculty of Computer Engineering, Amirkabir University of Technology, Tehran, Iran.
3. Department of Cognitive Modeling, Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Evidence accumulation models (EAM) have successfully modeled participants' behavior in (neuro)psychological tasks across different cognitive domains. The main issue with these models is the lacking of mechanisms for representing stimulus features and decision-makers knowledge. However, stimulus features and decision-makers knowledge are essential components of a decision process and can impact EAMs' parameters. We can address this issue by using an ANN-EAM framework. The ANN-EAM is a cognitive model that uses an artificial neural network (ANN) for stimulus representation, a mapping function for connecting the stimulus representation to the accumulation part, and an EAM.

Methods : This study aims to model participants' performance in the Lexical Decision Task while providing semantic representation for words and non-words using ANN-EAM. The lexical Decision task is one of the most widely used experimental paradigms in visual word recognition. Many of the computational models of lexical processing have been developed considering participants' performance in this task. We present two ANN-EAMs in this study, the first one combines the FastText word representation model and a race diffusion model (RDM) through a series of fully connected layers, and the second one employs the BERT language model instead of FastText. These combinations produce a representation from FastText or BERT that can feed into RDM for generating the decision process. To test the performance of these models, they are fitted on the part of the English Lexicon Project (ELP) dataset so that the neural network part is trained on the list of words and non-words from this dataset. Here, EAMs and mapping function parameters are estimated using hierarchical Bayesian estimation methods from trial-level data of ELP.

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Results : The comparison results show that the first model predicts participants' reaction time and accuracy more precisely than the second model according to the lower widely applicable information criterion (WAIC). The WAIC value of the first model is 651, while the WAIC value of the second model is 1304. An RDM benchmark model Also fitted to data and acquired a WAIC value of 914. The WAIC value of the first model is also lower than the benchmark model. These results indicate that the ANN-EAM framework can fit the lexical decision data well while simultaneously providing a representation of word and non-word features.

Conclusion : All in all, it seems that ANN-EAM performance is promising in helping us better understand the underlying processes of word recognition based on stimulus features.

Keywords : Cognitive modeling, Artificial neural network, Lexical decisions, Evidence accumulation models, Decision-making

Count: 12
Abstract ID: 453
subject: Cognition: Other
Presentation Type: Oral

Beneficial effects of standardized Cyperus rotundus L. alcoholic extract on the chronic mild stress-induced anxiety and depression in rats, associated with reducing TNF-α and oxidative stress

Submission Author: Ashkan Moallemi

Ashkan Moallemi[1], Farimah Beheshti[2]

1. Student Research Committee, Zahedan University of Medical Sciences, Zahedan, Iran
2. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : Introduction: Cyperus rotundus L. (C. rotundus) had been used for a long time in traditional Iranian medicine to treat memory and cognition disorders with antioxidant and anti-inflammatory activities. Increasing evidence indicates the concurrence and interrelationship of stress hormones, and depression. This study is aimed to determine the potential antidepressant effects of C. rotundus extract in chronic mild stress (CMS) induced anxiety and depression in rats.

Methods : Materials and Methods: The rats were treated as 1) Vehicle,2) CMS, 3-5)C. rotundus 100, 200, and 400 mg/kg+ CMS. Rats were subjected to CMS for a total of 4 weeks. During 4 weeks, they have received seven training trials. After behavioral tests, the brains of rats were collected to examine inflammation and oxidative stress damage criteria.

Results : Results: CMS increased serum corticosterone levels,cortical malondialdehyde(MDA), and tumor necrosis factor-α (TNF-α) levels while decreased superoxide dismutase (SOD), Catalase (CAT), and thiol. C. rotundus improved both the behaviors of the CMS rats in the open field (OF), elevated plus maze (EPM), and forced swimming (FS) tests and reversed the effects of CMS as well.

Conclusion : Conclusion: C. rotundus improved CMS-induced anxiety and depression via decreasing brain oxidative stress and inhibiting neuroinflammation. Moreover, it could decrease the corticosterone elevation induced by CMS.

Keywords : Cyperus rotundus L, Chronic mild stress, Depression, Anxiety, Oxidative stress, Neuroinflammation.

Count: 13
Abstract ID: 231
subject: Cognition: Other
Presentation Type: Oral

The effect of language on object recognition

Submission Author: Narges Kazerooni

Narges Kazerooni[1], Mahdi Purmohammad[2]

1. Department of Cognitive and Brain Sciences, University of Shahid beheshti, Tehran, Iran
2. Department of Cognitive and Brain Sciences, University of Shahid beheshti, Tehran, Iran

Background and Aim : Language and perception are two main cognitive systems. The interpretation of language and perception interactions is necessary to explain human behavior. Perception, as a basic cognitive function, is related to other cognitive functions and influenced by a set of top-down factors, such as attention, working memory and Language is one of the top-down factors that can affect perception and interacts with high-level processes such as recognition. A review of evidence related to visual recognition tasks has led to the hypothesis that top-down input from linguistic representations can activate visual feature detectors, indicating the influence of language on visual perception.

Methods : One of the ways to investigate the effect of language on object recognition is to present incomplete or ambiguous images.people perform well in recognizing conventionally presented images. For example, only 25% of people can recognize ambiguous images, and other people have trouble recognizing them, if they are allowed to see a normal version of an image that they have more experience recognizing, they will do well in recognition. In one study, after viewing actual upward or downward movement or reading a linguistic description of physical movement subjects viewed a picture of a bird whose head location was ambiguous, and then Participants were asked to pull the worm into the bird's beak. People's recognition of the bird's head was similarly affected by observing actual motion and by reading stories that described physical motion.

Results : One way of investigating such effects is that labels help form hypotheses about perceptual input, and an uninterpretable perceptual input becomes interpretable when it is made meaningful according to hypotheses generated by language. Language processing involves imagining or perceptually simulating the visual scenes being described, and have demonstrated that processing language can affect the speed and accuracy of processing visual stimuli.

Conclusion : The influence of language on perception reflects a dynamic interaction in which linguistic representations reinforce detectors of visual features, whereby feedback from linguistic or conceptual representations provides a means of enhancing activity in perceptual detectors associated with those representations. . In general, the effects of language on perception are interactive and predictive in nature, and the evidence can be explained and investigated in several areas, and the precise description of these interactions remains an important challenge.

Keywords : Language;Perception;Recognition

Count: 14
Abstract ID: 346
subject: Emotion, Motivation
and Behavior: Neural Basis of Human Behavior
Presentation Type: Oral

Are physical activity, motor functions and brain structures related to each other?

Submission Author: Ata Pourabbasi

Ata Pourabbasi[1], Amin Akbari Ahangar[2]

1. Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran
2. Department of BioMolecular Sciences, School of Pharmacy, The University of Mississippi, The United State of America

Background and Aim : Physical activity is one of the important aspects of lifestyle that can prevent the incidence of many non-communicable diseases. The relationship between physical activity and the cognitive disorders has been the topic of interest for neuroscience researchers in recent years. The results of several studies in this filed indicate the existence of a significant relationship between physical activity and cognitive functions, especially in the elderly. However, investigating the relation between physical activity and brain structural changes which can lead to cognitive disorders, is still unclear. The present study was conducted to evaluate the relationship between physical activity and brain structures.

Methods : This study was conducted on Human Connectom Project (HCP) data. Physical activity and motor function have been evaluated by four indices including Endurance, Strength, Dexterity and Gait speed. Also, brain structures were measured by volumetric study using Magnetic Resonance Imaging. Correlation between physical activity and motor functions with the volume of brain structures was evaluated through statistical tests.

Results : The average age of the subjects studied was 28.7 (22 and 37) years. The strength index had the highest correlation with the volume of brain structures. Gray matter volume, white matter volume, and total brain volume are the most brain structures that had the highest correlation with motor functions.

Conclusion : Based on the results of this study, there is a significant correlation between physical activity and motor functions and brain volumes. In such a way that higher physical activity is associated with larger brain volumes. This correlation can justify the effect of physical activity on

cognitive functions to a great extent, so that physical activity can improve these functions to some extent by improving neural structures. The results of other studies, including the relationship between sarcopenia and the occurrence of cognitive disorders, are another proof of the existence of this correlation. Because in the present study, muscle strength has the highest correlation with brain volumes. Additional studies are recommended to discover the cause-and-effect relationship between physical activity and brain structural changes.

Keywords : brain, physical activity, motor, behavior

Count: 15
Abstract ID: 235
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Oral

Effects of Chronic Partial Sleep Deprivation Along With Circadian Rhythm Disruption On Renal Structure and Function in Rats

Submission Author: Shirin Rezazadeh

Shirin Rezazadeh[1], Mohammad Mahdi Hassanzadeh-Taheri[2], Hamed Shoorei[3], Mehran Hosseiny[4], Saeed Rastgoo[5], Mohammad Reza Saebipour*[6]

1. Birjand University of Medical Sciences, Department of Anatomical sciences, Msc Student of Anatomical Sciences
2. Birjand University of Medical Sciences, Department of Anatomical sciences, Professor
3. Birjand University of Medical Sciences, Department of Anatomical sciences, Assistant Professor
4. Kerman University of Medical Sciences, Department of Anatomical sciences, PhD Student of Anatomical Sciences
5. Birjand University of Medical Sciences, Department of Anatomical sciences, Msc Student of Anatomical Sciences
6. Birjand University of Medical Sciences, Department of Anatomical sciences, Professor

Background and Aim : sleep as a biological necessity, plays an important role in our health. Nowadays, improving technology and rotating work times, which is known as shift work, affect sleep duration and its quality and may cause shift work sleep disorders (SWSD). Previous studies demonstrated the relationship of acute and chronic sleep deprivation (SD) or circadian rhythm disruption on various body organs. Despite this fact, the effects of sleep deprivation along with circadian rhythm disruption on kidneys have been less studied, so this animal model was conducted to evaluate the similar condition of chronic insomnia and shift work on renal structure and function of male Wistar rats.

Methods : In this study, 40 male adult Wistar rats (8-week-old) were randomly divided into 5 groups(n=8/group): control, circadian rhythm disruption (CIR), sleep deprivation under light condition (SD-AM), sleep deprivation under dark condition (SD-PM), sleep deprivation plus circadian rhythm disruption (SD-CIR). Chronic sleep deprivation was induced by a programmable sleep deprivation machine 4 hours per day for 28 consecutive days. In order to provide circadian rhythm disruption, the normal light/dark cycle of laboratory was changed to 3.5h: 3.5h. Finally, all animals were euthanized and blood samples and kidneys were collected for histopathological evaluations. Moreover, food consumption during the last week of experiment and weight gain were compared.

Results : Sleep deprivation and light/dark cycle disturbances negatively affect water intake in all studied groups. Also, food intake significantly decreased in CIR and SD-CIR groups. Moreover, rats of SD-CIR group gained significantly less weight than rats of the control group. Serum MDA levels were significantly elevated in SD-PM and SD-CIR groups. Although, no statistically differences in the other studied parameters like urea, Cr, SOD levels of plasma were found between the studied groups. According to our findings, histopathological evaluations showed no significant changes in this study protocol. No death was observed during the study.

Conclusion : The result of this study demonstrated that SD and circadian rhythm alterations showed detrimental effects on feeding, weight gain rate and also MDA levels of plasma. Other parameters showed no significant changes during the study.

Keywords : chronic sleep deprivation; circadian rhythm; renal structure; renal function; rat

Count: 16
Abstract ID: 65
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Oral

Exogenous growth hormone administration during chronic total sleep deprivation changed the miR-9 and DRD2 expressions followed by improvement the hippocampal synaptic potential and inflammation in rat

Submission Author: Parisa Arvin

Parisa Arvin[1], Alireza Sarkaki[2], Yaghoub Farbood[3], Samireh Ghafouri[4], Kowsar Bavarsad[5], Somayeh Hajipour[6], Seyed Esmaeil Khoshnam[7], Esrafil Mansouri[8]

1. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
2. Persian Gulf Physiology Research Center, Basic Medical Sciences research Institute, Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
4. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
5. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
6. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
7. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.
8. Department of Physiology, Medicine Faculty, Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : Total sleep deprivation (TSD) causes several harmful changes in the brain, including impaired cognition and decreased level of growth hormone (GH) in serum. GH has been shown to stimulate cell growth and enhance learning and memory. The present study was aimed to elucidate the putative effects of exogenous GH, against TSD-induced learning and memory dysfunctions and possible involved mechanisms.

Methods : To induce TSD, rats were housed in homemade special cages equipped with stainless steel wire conductors to induce general and inconsistent TSD. They received a mild repetitive electric shock to their paws every 10 minutes for 21 days. GH (1 ml / kg, SC) was administered to adult young male rats once daily for 21 days during induction of TSD. Spatial learning and memory performance, inflammatory status, miR-9 expression, DRD2 protein level, and hippocampal histological changes were assayed at scheduled times after TSD.

Results : The results indicated that TSD impaired spatial cognition ($p<0.001$), increased TNF-? ($p<001$), decreased level of miR-9 and increased DRD2 levels ($p<0.001$ and $p<0.001$ respectively).

Treatment with exogenous GH improved spatial cognition ($p<0.001$), decreased TNF-? ($p<0.01$), increased level of miR-9 and decreased DRD2 levels ($p<0.001$ and $p<0.001$ respectively) after TSD.

Conclusion : Our findings suggest that GH played a key role in the modulation of learning and memory disorders as well as the treatment of abnormal DRD2-related functional disorders associated with miR-9 in TSD.

Keywords : Sleep deprivation; growth hormone; spatial cognition; miR-9 expression; DRD2 expression; TNF-α.

Count: 17
Abstract ID: 71
subject: Emotion, Motivation
and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

Effect of Prenatal Stress and Extremely Low Frequency Electromagnetic Field Exposure on Spatial Learning and Memory in Adult Male Offspring

Submission Author: Hajar Abkhezr

Hajar Abkhezr[1], Shirin Babri[2], Mahsa Farid-Habibi[3], Fereshteh Farajdokht[4], Saeed Sadigh-Eteghad[5], Gisou Mohaddes[6]

1. Neurosciences research center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
2. Tabriz University of Medical Sciences, Medical Faculty, Physiology Department, Tabriz, Iran
3. Tabriz University of Medical Sciences, Medical Faculty, Physiology Department, Tabriz, Iran
4. University of Medical Sciences, Medical Faculty, Physiology Department, Tabriz, Iran
5. Neurosciences research center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
6. University of Medical Sciences, Medical Faculty, Physiology Department, Tabriz, Iran

Background and Aim : The aim of this study was to determine the effect of stress and extremely low-frequency electromagnetic field (ELF-EMF) before and during pregnancy on the spatial memory of adult male offspring.
Methods : Female Wistar rats were randomly divided into four groups (n=6): control group (exposure to off ELF-EMF and no exposure to stress), stress group (exposure to stress), EMF group (exposure to ELF-EMF), and S+EMF group (simultaneous exposure to stress and the ELF-EMF). Animals received interventions before and during pregnancy, 21 days before, and 21 days during pregnancy (for 42 days). On the 90th postnatal day of the offspring, spatial memory was tested using Morris Water Maze.
Results : Before and during pregnancy Stress had no effect on the spatial memory of male offspring. The ELF-EMF had no effect on the spatial memory of male offspring. Simultaneous stress induction with the ELF-EMF disrupted the acquisition phase of spatial memory.
Conclusion : Stress increased corticosterone without affecting the spatial memory of adult male offspring. ELF-EMF had no effect on spatial memory. However, the induction of ELF-EMF with stress has a destructive impact on spatial memory. Further studies are needed to investigate the combined effect of stress and ELF-EMF before and during pregnancy.
Keywords : Prenatal stress, ELF-EMF, Spatial memory, BDNF

Count: 19
Abstract ID: 398
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Oral

The effects of aminoguanidine on hippocampal cytokines, amyloid beta, brain-derived neurotrophic factor, memory and oxidative stress status in chronically lipopolysaccharide- treated rats

Submission Author: Fatemeh Kaffashan

Fatemeh Kaffashan[1], Mobina Mehdizade[2], Farimah Beheshti[3]

1. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
3. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran

Background and Aim : In the present study, the effects of aminoguanidine (AMG) on hippocampal cytokines, amyloid beta, brain-derived neurotrophic factor, oxidative stress status and memory in chronically lipopolysaccharide (LPS) treated rats were investigated.

Methods : The rats were divided into five groups and treated: 1) Control (Saline), 2) LPS (1 mg/kg), 3-5) LPS- AMG50, LPS-AMG100, and LPS-AMG150 (AMG 50, 100 and 150 mg/kg 30 min before LPS injection). The treatment started five weeks prior to the behavioral experiments and was carried on during the behavioral tests (LPS injection two hours before each behavioral evaluation). Finally, we removed brain tissue for biochemical measurements.

Results : The escape latency in Morris water maze (MWM) test and the latency to enter the dark compartment in Passive avoidance (PA) test in LPS group were significantly greater than in the control ($P < 0.001$). While, in LPS-AMG 100 and LPS-AMG150 groups they were less than LPS group ($P < 0.001$). Malondialdehyde (MDA), NO metabolites of hippocampal and cortical tissues and interleukin- 6 (IL-6), amyloid beta(Aβ) and tumor necrosis factor-α (TNFα) concentration in the hippocampus of LPS group were higher than control group ($P < 0.001$- $P < 0.05$). However, in LPS-AMG 100 and LPS-AMG150 group they were lower than LPS group ($P < 0.001$- $P < 0.05$). The thiol content and the activities of catalase (CAT) and superoxide dismutase (SOD) in both cortical and hippocampal tissues of LPS group reduced compared to control group ($P < 0.001$- $P < 0.05$). These factors enhanced in LPS-AMG 100 and LPS-AMG150 groups compared to LPS ($P < 0.001$- $P < 0.05$). The hippocampal content of brain-derived neurotrophic factor (BDNF) in LPS

group was significantly lower compared to the control group (P <0.001). All treated group had higher BDNF content in comparison to LPS group (P<0.01-P < 0.001).

Conclusion : The findings indicated that protective effects of AMG against LPS-induced memory were accompanied by decreasing of inflammatory cytokines, Aβ, oxidative stress and increasing of anti-inflammatory mediators and BDNF.

Keywords : Learning; Memory; Lipopolysaccharide; Aminoguanidine; Amyloid beta; Brain-derived neurotrophic factor; Cytokines

Count: 20
Abstract ID: 370
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Oral

Functional interaction between endocannabinoid and nitric oxide systems of the dentate gyrus in scopolamine-induced memory loss in mice

Submission Author: Fateme Mamdouh

Fateme Mamdouh[1], Ameneh Rezayof[2], Sakineh Alijanpour[3]

1. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
2. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Department of Biology, Faculty of Science, Gonbad Kavous University, Gonbad Kavous, Iran

Background and Aim : Memory loss is a common public health problem in the elderly, affecting various aspects of life quality. Thus, clarifying the underlying mechanisms implicated in this disease will provide a new approach to developing appropriate pharmaceuticals. Scopolamine, an anticholinergic agent, induces memory deficits in experimental animals to study Alzheimer-type dementia (AD). The hippocampal dentate gyrus (DG) has a crucial function in memory formation. Given the role of the nitric oxide synthase (NOS) pathway and cannabinoid transmission in cognitive function, the present study aimed to investigate the role of the DG NOS pathway under scopolamine-induced amnesia in mice. Furthermore, the possible involvement of DG CB1 cannabinoid receptors was examined in this treatment.

Methods : Adult male NMRI mice were bilaterally cannulated in the DG regions using a stereotaxic apparatus. A single-trial step-down passive avoidance paradigm was applicated for memory assessment.

Results : : Post-training intraperitoneal administration of scopolamine (0.1-1 mg/kg) impaired memory retrieval in a dose-dependent manner. Microinjection of a precursor of nitric oxide, L-arginine into the DG inhibited memory loss produced by scopolamine (1 mg/kg). It should be considered that the microinjection of the same doses of L-arginine alone had no effect on memory retrieval. Interestingly, the blockade of dentate gyrus CB1 receptors by AM-251 potentiated the response of an ineffective dose of L-arginine on scopolamine.

Conclusion : Overall, these findings indicate that the NOS pathway is possibly involved in the scopolamine effect on memory formation through the CB1 cannabinoid receptors of the dentate gyrus.

Keywords : Scopolamine; Memory loss; NOS pathway; CB1 receptors; Mice

Count: 21
Abstract ID: 242
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Oral

Glucocorticoid receptors of infralimbic regulate mRNA expression of amygdala glucocorticoid, mineralocorticoid and dopamine D2 receptors in fear memory extinction

Submission Author: Masoomeh Dadkhah

Masoomeh Dadkhah[1], Abbas Ali Vafaei[2], Ali Rashidy-Pour[3], Neghin Gholizadeh[4]

1. Pharmaceutical Sciences Research Center, Ardabil University of Medical Sciences, Ardabil, Iran
2. Research Center of Physiology, Semnan University of Medical Sciences, Semnan, Iran
3. Research Center of Physiology, Semnan University of Medical Sciences, Semnan, Iran
4. Student Research Committe, School of Health, Ardabil University of Medical Sciences, Ardabil, Iran

Background and Aim : The infralimbic (IL) area of prefrontal cortex and amygdala are critical brain structures for extinction which contain both dopamine and glucocorticoid receptors. Fear extinction refers to reduction in conditioned responses follow the repeated presentation of conditioned stimulus, appears to require these receptors. The aim of the present study is to determine whether amygdala glucocorticoid and dopaminergic systems mediates the IL glucocorticoid receptors function in auditory fear extinction.

Methods : Adult male Wistar rats (250–280 g) were randomly divided into 3 experimental groups. Animals were mounted in a stereotaxic device and canula implanted into IL (2.9 mm anterior, 1.0 mm lateral, and 5.0 mm ventral). The glucocorticoid receptor ligand, corticostrone (CORT) was dissolved in saline and was injected at a volume of 20 ng/0.5 µl in each hemisphere. We administered mifepristone (RU38486), a GR receptor antagonist which was first dissolved in 100% propylene glycol, followed by dilution in saline to reach the appropriate concentration, and was injected at a volume of 3 ng/0.5 µl in each hemisphere. Control animals received the vehicle only. We also examined alternations in mRNA expression of DRD, Nr3C1, and Nr3C2 in a rat model of auditory fear extinction. Data were analyzed using SPSS version 23. One way ANOVA which followed by Tukey's test for multiple comparisons. Data are represented as the mean ± SEM. P values of $p < 0.05$ were considered statistically significant.

Results : The results indicated that decrease in freezing induced by intra-IL CORTinjection led to decreased freezing and DRD expression and increased Nr3C1, Nr3C2 expression in the amygdala suggesting that the effects of this GR ligand may be performed due to reduction in amygdala DRD

expression. Consistent with this result, mefipristone infusion in IL has the same effect on freezing and Nr3C2 expression, but decreased Nr3C1 and DRD expression in the amygdala. One-way ANOVA indicated that there was a significant differences in mRNA expression of Nr3C1 after the acquisition of extinction among the three experimental groups ($P<0.05$).The results indicated that decrease in freezing induced by intra-IL CORTinjection led to decreased freezing and DRD expression and increased Nr3C1, Nr3C2 expression in the amygdala suggesting that the effects of this GR ligand may be performed due to reduction in amygdala DRD expression. Consistent with this result, mefipristone infusion in IL has the same effect on freezing and Nr3C2 expression, but decreased Nr3C1 and DRD expression in the amygdala. One-way ANOVA indicated that there was a significant differences in mRNA expression of Nr3C1 after the acquisition of extinction among the three experimental groups.

Conclusion : Together, these data suggest that despite reciprocal connections between amygdala and mPFC, block of GRs in IL area did not affect the expression of these receptors but reduced MRs in amygdala. In addition RU38486 has different effect on mRNA expression of amygdala dopamine D2 receptors, indicating the importance of glucocorticoids in mediating of amygdala dopaminergic system function.

Keywords : Glucocorticoid receptors; Dopamine D2 receptors; Basolateral amygdala; infralimbic; mRNA expression; Auditory Fear extinction

Count: 22
Abstract ID: 199
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Oral

Emotion recognition based on EEG signals using fluctuation-based dispersion entropy

Submission Author: Yeganeh Alidoost

Yeganeh Alidoost[1], Babak mohammadZadeh Asl[2]

1. Bioelectrical engineering
2. Bioelectrical engineering

Background and Aim : Brain-computer interface (BCI) is an emerging technology that allows communication between brain signals and external devices. Emotion recognition is a vital part of BCIs. One of the methods of recognizing emotions is through electroencephalogram (EEG) signals. Recording of EEG signals is noninvasive and by considering the low cost and its high temporal resolution, emotion recognition based on EEG signals has an essential role in affective computing. Because of the nonstationary nature of EEG signals, entropy measures can assess their chaotic behavior, intricacy, and unpredictability.

Methods : The DEAP dataset is used in this work which is available online for EEG emotion recognition. This dataset consists of EEG signals recorded from 32 subjects. Each volunteer has 40 trials, i.e., 40 EEG signals, recorded from 32 channels while watching 40 1-minute music videos. In this work, the emotion recognition process based on EEG signals includes signal preprocessing, feature extraction, data augmentation, and classification. In preprocessing step, we select a piece of EEG signal, then it is filtered by a Butterworth filter to distinguish four rhythms, namely the theta (4-8 Hz), alpha (8-14 Hz), beta (14-30 Hz) and gamma (30-45 Hz). Signals of four frequency bands and undecomposed signals are segmented with a 4s sliding time window with 2s overlapping. In the feature extraction step, the Fluctuation-based dispersion entropy (FDispEn) feature is extracted from each window and the average value of all extracted features is used in each trial as the final feature. So, a total of (32*40) data samples were formed, which denotes channels* trials(video) for each subject. Since the number of samples of EEG signals from different classes in the DEAP dataset is unequal, the Over-Sampling technique is employed to prevent overfitting and equalize samples. Finally, by using the SVM classifier with a radial basis function (RBF) kernel, emotional states are classified in the valence-arousal emotional model.

Results : We have used the EEG signals from the publicly available DEAP dataset to test the effectiveness of our proposed feature and accuracy improvement. Our proposed method indicates the best accuracy and F1-Score in γ wave. An accuracy of 82.05% and F1-Score of 81.86% is obtained in high Arousal / low Arousal (HA/LA) from γ rhythm. An accuracy of 80.05% and F1-Score of 80.75% is obtained in high Valence / low Valence (HV/LV) from γ rhythm. Accuracies of 72.70%, 79.21%, 78.95%, and 67.92% are obtained from β, α, θ, and undecomposed signals, respectively. These results indicate the effectiveness of decomposing the original signal into four typical frequency bands. This means that the original signal contains extra information unrelated to emotions that reduces the model's performance.

Conclusion : An EEG-based emotion recognition method based on fluctuation-based dispersion entropy was proposed, showing high accuracy with low time complexity. We found that using this feature, the Gamma rhythm has a higher correlation with emotion, and the Beta rhythm has less correlation with emotion. Finally, obtained results show that Entropy is a nonlinear feature that can describe the dynamic activity of EEG signals which are related to emotions.

Keywords : Emotion Recognition; EEG signal; Fluctuation-based dispersion entropy; Random Over-sampling.

Count: 23
Abstract ID: 290
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Oral

Negative news and its Consequents on Psychological Symptoms and Brain Response

Submission Author: Elham Mirshah

Elham Mirshah[1], Farnoush Azizi [2]

1. Ph.D Student, Department of Nursing, Faculty of Medical Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Nursing, Faculty of Medical Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : The way news is reported has changed significantly in recent years. The tone of today's news is increasingly emotional, visual, and shocking, and its interpretations are conveyed negatively to people. The aim is to review the research conducted in the field of psychological symptoms and brain responses related to emotional and negative news.

Methods : This study was conducted in the database of PubMed, Scopus, Google scholar and Science Direct from January 1990 to December 2022, by search¬ing for keywords included negative news, brain response, psychological symptoms and neurobiological effects, in title and abstract. Inclusion criteria included all studies published in English that examined the effect of negative news and stress on brain response and psychological symptoms

Results : The results of various researches show that there are many psychological symptoms in people who are exposed to negative news daily and the resulting stress, such as negative emotional reactions, anxiety, panic, sad mood, indifference, loss of performance, avoidance reactions, suicide idea and the effect on people's judgment. Also, negative news affects brain responses such as Imbalance of neural circuits, Disruption of hormonal responses, Increased interleukin 1-β (IL-1) and Brain development.

Conclusion : When negative news is followed by activities like doom scrolling, the body's nervous system releases stress hormones such as cortisol and adrenaline. Chronic stress can cause the imbalance of neural circuits in cognition, anxiety, mood and decision making. Adverse mental experience interacts with the alleles of certain genes and has an adverse effect on brain cells through the epigenetic system. The results of Bruce McEwenstudy showed that chronic stress changes the way brain neurons communicate with each other. Also, the effect of chronic stress on

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male rats showed that their offspring have incomplete hormonal responses. Stress changes the expression of genes in sperm and affects the brain development of their children. The results of other studies also showed that chronic stress can increase interleukin-1- β (IL-1) in astrocytes of the hippocampus, an area involved in learning and memory. Due to the lack of research on the impact of negative news on brain responses, it is suggested to work on this topic.

Keywords : negative news, brain response, psychological symptoms

Count: 24
Abstract ID: 184
subject: Neuropsychiatry and Psychology: Disorders of Executive Functions
Presentation Type: Oral

Studying Neuropsychological Profile in Adult ASD Patients at Roozbeh Hospital in 2021

Submission Author: Seyede Sajedeh Seyed Alipour

Seyede Sajedeh Seyed Alipour[1], Javad Alaghbandrad- Mahtab Motamed[2], Mehdi Tehranidoost-Zahra Hooshyari[3]

1. Department of Medicine, Division of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Medicine, Division of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran.
3. Department of Medicine, Division of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran.

Background and Aim : Executive functioning (EF) deficits have been widely studied among children and adolescent with autism spectrum disorder (ASD); however, a significant lack of knowledge exists about EF deficits among adults with ASD. Due to the remarked importance of precise and early stage diagnosis, this study was devoted to find out a definite pattern of EF difficulties among adults with ASD, which may lead to gradual improvement of public health.

Methods : A cross-sectional study was made on a sample group who was selected among patients referred from out-patients clinic at Roozbeh hospital over a time span of one year, whom have been diagnosed by a psychiatrist. Sampling was made among consecutive and available participants who met the inclusion criteria and consented to take part in this study. The size of sample was calculated to be 52; it was based on proper values of alpha and t-test power which were reported from previous studies. After documenting demographic data of participants particularly their age, gender and education, they were examined using different measures such as Standford-Binet Intelligence Scale (SBIS), Autism Questionnaire (AQ), Ritvo Autism Asperger diagnostic scale (RAADS), Rey-Osterrieth Complex Figure (ROCF), Cambridge Neuropsychological Test Automated Battery (CANTAB) and Social Responsiveness Scale (SRS). The results were analyzed using T-Test statistical method with SPSS-26 software.

Results : Main results revealed that the target group performance in nearly all domains of executive functions were significantly worse than average performance of general population. Full Scale IQ (t=3.911, p<0.001), Verbal IQ (t=2.928, p<0.001), Non-Verbal IQ (t=4.545, p<0.001), Fluid Reasoning (t=3.799, p=0.001), Knowledge (t=2.470, p=0.018), Quantitative reasoning (t=3.514, p=0.001), Visual spatial Processing (t=4.140, p<0.001), Working Memory (t=3.148, p=0.003) were less than general population. In all domains of CANTAB the score was significantly

different from Z score(general population distribution). Scores of SRS (t=8.533, p<0.001), AQ (t=6.055, p<0.001) and RAADS (t=11.968, p<0.001) were higher than general population.

Conclusion : There are significant problems in executive functioning in adult ASD that cause impairment in social and occupational areas of functioning, which necessitates further investigations in this subject.

Keywords : Autism Spectrum Disorder; Adult ASD; Neuropsychological Profile;

Count: 25
Abstract ID: 347
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

The relation between sleep disorders and suicidal behavior in children

Submission Author: Maryam Khoshnazar

Maryam Khoshnazar[1], Mahdi Nasiri[2]

1. Student Research committee, School of medicine, Mazandaran University of Medical Sciences, Mazandaran, Iran
2. Student Research committee, School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Mazandaran, Iran

Background and Aim : In early adolescence, several prevalent psychopathological entities are linked to suicidal ideation and sleep-related issues. According to research, sleep is crucial for the emergence, maintenance, and advancement of mood disorder symptoms in kids and teenagers. Suicidality has also been directly linked to sleep issues.

Methods : The study's topic was covered by articles that were published between 1987 and 2022 and that used the keywords "sleep disorder," "sleep disturbance," "suicide," and "children" in the PubMed, Google Scholar, and Scopus databases. The input criteria were used to choose and study 22 English articles.

Results : Depression in young people may be predicted and preceded by sleep issues. Children and teenagers who experience co-occurring mood disorders and sleep issues are at an especially high risk for developing self-harm and suicidality, having more severe mood episode symptoms, and not responding as well to treatment. Insomnia, obstructive sleep apnea, and circadian rhythm disorders are linked to both depression and bipolar disorder in children and young adults, whereas specific sleep disorders such parasomnias, narcolepsy, and sleep-related movement disorders are linked to depression. On the other hand, children and teenagers with depression may experience a variety of sleep issues, and these are linked to more severe depression, increased fatigue, suicidal thoughts, bodily complaints, pain, and impaired focus. According to a study, 86.7% of the samples overall who reported having sleep issues (around 7.1%) also reported having suicide thoughts. Any suicidal ideation as well as each type of ideation separately were linked to sleep-related issues. Another study looked at the relationship between early sleep disruptions and later and contemporaneous suicidal thoughts and behaviors (in different models) throughout childhood and adolescence. Even when controlling for the past and contemporaneous depression severity, the results show that sleep issues in early childhood are linked to an increased likelihood of suicidal

thoughts beyond the age of 8. Poor sleep was linked to nightmares, and both poor sleep and nightmares were linked to suicide thoughts. According to a study, sleep problems and suicidal thoughts and behaviors occur frequently (66.4% and 52.3%, respectively) and both symptoms are present in 37.9% of patients. When sleep disruptions were evident as children, children with more severe anxiety symptoms were more likely to have SI later in life.

Conclusion : According to this study, children's sleep issues and suicide thoughts are related. To create viable preventative and treatment strategies for juvenile suicidal behavior, a deeper comprehension of the connections between suicidal ideation, sleep quality, and sleep-related cognitions is required.

Keywords : Sleep, sleep disorders, suicide, children

Count: 26
Abstract ID: 353
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

Pornography addiction and depression: is the gut microbiota the missing piece of this connection?

Submission Author: Ardeshir Nabizadeh zolpirani

Ardeshir Nabizadeh zolpirani[1], Hamideh Asadinezhad[2]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Porn addiction is an addiction to watching pornography in a way that disrupts daily life, personal relationships, and sexual activity, and it is considered a sexual disorder that is increasing and can lead to problems in sexual functioning, particularly in the young population and also leads to psychological problems. According to recent studies, pornography addiction can increase the risk of depression through mechanisms related to chronic stress.

Methods : Research materials were extracted from 40 articles using the following databases: Science Direct, Google Scholar, and PubMed and using the keywords: depression and pornography, dysbiosis and chronic stress, pornography, and cortisol, depression neural pathways.

Results : According to our findings, long-term stress through the high level of serum cortisol can change the microbial composition of the gut which is called dysbiosis. It seems that dysbiosis can change the activity of the brain through different pathways including inflammation, changes in the activity of the vagus nerve, alternation in the hypothalamus-pituitary-adrenal axis(HPA), and the metabolic pathway. Microbiota dysbiosis that results from chronic stress and elevated level of cortisol alternates levels of inflammatory molecules like IL-6 and TNF-α and anti-inflammatory molecules like prostaglandin E2 and thromboxane B2. On the other hand, dysbiosis can alter the production of active metabolites such as serotonin, dopamine, GABA, and short-chain fatty acid(SCFA), which can change the activity of the vagus nerve by interacting with their specific receptors and thus change the brain's neural activity. Research has also shown that depression is associated with a decrease in the level of many neurotransmitters such as dopamine and serotonin, so there is a change in the population of gut bacteria involved in the production of the mentioned substances, such as Bifidobacterium and Lactobacillus, can disrupt the mesolimbic dopamine pathway and serotonin pathways involved in depression because of the long-term effect of the high level of serum cortisol and chronic stress.

Conclusion : Depression is a chronic mental disorder that disrupts a person's thoughts, mood, and physical health, and it is one of the most common mental disorders diagnosed in young people, on the other hand, addiction to pornography, is one of the behavioral disorders can lead to depression, therefore in this article we proposed a new approach to depression caused by pornography addiction by establishing a cross-link between the effect of pornography addiction, microbiota-gut-brain axis, chronic stress and high level of cortisol.

Keywords : Pornography addiction, Depression, Microbiota, Stress

Count: 27
Abstract ID: 348
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Oral

The efficacy and safety of adding memantine to sertraline in individuals with major depressive disorder: A triple-blind randomized controlled clinical trial

Submission Author: Kiarash Saleki

Kiarash Saleki[1], Ava Nasiri[2], Ali Bijani[3], Farzan Kheirkhah[4], Romina Hamzehpour[5], Sussan Moudi[6], Angela Hamidia[7]

1. Student Research Committee, Babol University of Medical Sciences, Babol, Iran.; USERN office, Babol University of Medical Sciences, Babol, Iran.
2. Department of Psychiary, Babol University of Medical Sciences, Babol, Iran; Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Non-Communicable Pediatric Diseases Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
4. Department of Psychiary, Babol University of Medical Sciences, Babol, Iran; Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
5. Department of Psychiary, Babol University of Medical Sciences, Babol, Iran; Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
6. Department of Psychiary, Babol University of Medical Sciences, Babol, Iran; Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
7. Corresponding author: Department of Psychiary, Babol University of Medical Sciences, Babol, Iran; Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Patients with major depressive disorder (MDD) do not reply to first-line depression treatment with sufficient dose and consumption duration and tolerance. Moreover, the glutamatergic system can affect the neuropathology and treatment of MDD, therefore, memantine and other medications that affect glutamate can be introduced as new augmentation for treatment of depression. Accordingly,this study has been conducted in order to examine the consequence of adding memantine to sertraline to treat patients suffering from major depressive disorder.

Methods : 54 MDD cases were enrolled and randomized into treatment and control groups; treated using memantine (20 mg) with sertraline (n = 26) or placebo with Sertraline (n = 28) for 8-weeks. Patients were assessed using the Hamilton Depression Rating Scale (HDRS) at baseline and at weeks 2, 4, as well as 8. The subgroups were compared in terms of therapy efficacy in resolution of depressive presentations and adverse events (safety). This triple-blinded randomized controlled

clinical trial with has been approved with the tracking number (IRCT20170606034348N4) in the Iranian clinical trial registration system

Results : The present trial found a significant improvement in 3 follow-up sessions in the memantine group (p = 0.026) and also showed a more favorable response in the follow-up sessions in the memantine-administered patients (HR (Hazard Ratio) = 2 / 09 c195%: 1 / 73-3 / 73, p = 0/012)). The memantine subgroup exhibited quicker recovery time and response to treatment and there was a clear reduction in the scores of the Hamilton Depression Rating Scale compared to the start of the study in weeks 2, 4, and 8 in the memantine subgroup (p = 0.002, p = 0. 001, p <0/001). The memantine subgroup displayed a meaningfil attenuation of the mean dose of sertraline at weeks 4 and 8 (p = 0.01, p = 0.009).

Conclusion : The present work suggests that treatment by memantine in order to boost sertraline efficacy is safe and a clearly effectual is MDD patients. These findings warrant further research with combinational Sertraline/Memantine as well as smart and flexible dosing to avoid side effects.Also, as memantine was not more effective to placebo in previous studies, our study demands confirmation in upcoming trials with larger sample size.

Keywords : Memantine; sertraline; major depressive disorder; neuropsychiatry

Count: 28
Abstract ID: 438
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Oral

Effects of Emotionally Focused Therapy on PTSD and depression in Injured athletes

Submission Author: Narges Papi

Kosar jalae[1], Fereshteh amouzadeh[2], Narges papi[3], Shiva hashemi[4]

1. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
2. Ph.D. in sport Psychology, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Tehran, Tehran, Iran
3. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
4. Ph.D. in sport Psychology, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Tehran, Tehran, Iran

Background and Aim : an athlete, may be injured during sports activities. Sports injuries are not only limited to physical injuries, but can damage self-confidence, self-belief and sense of identity as an athlete. And be associated with PTSD and depression. The aim of this study was to investigate the effects of Emotionally Focused Therapy on PTSD and depression in Injured athletes.

Methods : The statistical population of this research was injured athletes and 30 injured athletes 18-21 years old with an age average (20.12(5.31 years) who voluntarily participated in the present study and were randomly divided into control and experimental groups (n=15 in each group). The experimental group underwent emotional therapy for 10 weeks and 3 sessions per week, each session lasting 45 minutes. The control group didn't have any intervention. Depression and anxiety with anxiety and depression questionnaire for hospital use. Statistical analysis was performed using SPSS software version 23. ($p < 0.05$)

Results : The results of variance analysis with repeated measures showed a significant decrease in depression and anxiety in injured athletes($p = 0.018$) in the experimental group. Two weeks after the post-test it remained.

Conclusion : According to the obtained results, Emotionally Focused Therapy has a positive and significant effect on control among injured athletes. And according to the stable training results, it is suggested to use Emotionally Focused Therapy in reducing PTSD and depression in injured athletes.

Keywords : PTSD, depression, Injured athletes.

Count: 29
Abstract ID: 99
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Oral

Evaluating potential therapeutic effects of Psilocin in a PTSD model in rats: new horizons in PTSD treatment

Submission Author: Keyvan Ghasemi

Keyvan Ghasemi[1], Matin Toulami[2], Ahmad Reza Dehpour[3], Amirahmad Salarian[4], Elahe Golalipour[5]

1. Experimental Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran
2. Institute for Cognitive Sciences Studies, Tehran, Iran
3. Distinguished Professor of Pharmacology, Tehran University of Medical Sciences
4. Toxicology Research Center, Aja University of Medical Sciences, Tehran, Iran
5. School of Medicine, 440827Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Post-traumatic stress disorder (PTSD) is a psychiatric condition marked by increased stress and anxiety. Caused by exposure to traumatic incidents PTSD characterized by re-experiencing traumatic event, avoiding stressful stimuli, cognition and mood symptoms and hyperarousal. 5-HT receptors are believed to play a pivotal role both in development and treatment of PTSD. Psilocin, a serotonergic psychedelic with therapeutic potentials could alleviate depressive and anxiety related symptoms in on PTSD-like symptoms in single prolonged stress paradigm, a rodent model of PTSD

Methods : After being subjected to the SPS, rats were treated with three injections of Psilocin (0.05 and 0.075 mg/kg IP) and Saline. 24 hours after the last injection, Rats were subjected to behavioral testings open field, elevated plus maze and forced swimming test.

Results : The results revealed that low doses of Psilocin increased exploratory behavior in the elevated plus maze test and open field. In contrast, locomotor activity in the open field and immobility in the FST did not change

Conclusion : The results of this study suggest the potential anxiolytic effects of Psilocin in the PTSD-like symptoms in rats

Keywords : Post traumatic stress; Psilocin; Psilocybin; 5HT2A; Single Prolonged Stress

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Count: 30
Abstract ID: 97
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

A Pilot Study of Cue-Exposure Combined with Episodic Future Thinking (CIREF) Intervention on Craving in Opioid Users Receiving Methadone

Submission Author: Matin Toulami

Matin Toulami[1], Tara Rezapour[2], Keyvan Ghasemi[3], Parnian Rafei[4], Mohammad Salehi[5], Hamed Ekhtiari[6]

1. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
3. Tehran University of Medical Sciences (TUMS) Tehran, Iran
4. Faculty of Psychology and Education, University of Tehran, Tehran, Iran
5. Iranian National Center for Addiction Studies, Tehran University of Medical Sciences, Tehran, Iran
6. Department of Psychiatry, University of Minnesota, MN, USA

Background and Aim : Substance use disorder is a complex neurobiological disease, essentially concomitant with maladaptive learning and drug-related memories. The salient and persistent nature of these memories cause strong craving toward drug use and frequent relapsing in individuals with substance use disorders. Consequently, drug craving that results in drug-seeking behaviors and drug use interfere with the maintenance treatment which focuses on long-term sobriety. Interventions targeting the drug-related memories may impede relapsing and help individuals to remain in the treatment. A growing body of evidence suggests that Episodic future thinking (EFT), envisioning oneself in the probable future events, might have therapeutic potentials to reduce addictive behaviors. The current study aimed to investigate the efficacy of drug cue-exposure combined with episodic future thinking (CIREF) on craving in a sample of individuals receiving Methadone Maintenance Treatment (MMT).

Methods : Participants were randomly allocated into CIREF and active control (Episodic Recent Thinking (ERT)) groups (CIREF= 12, ERT= 12, Mage= 35.97, male). Participants were asked to generate narrative personalized opioid-related cues for 6 time intervals (CIREF group: 1 day, 1 week, 1 month, 3 month, 6 month and 1 year in future, ERT group: 1 day, 3 days, 5 days, 7 days, 9 days and 11 days in the recent past). The CIREF intervention protocol consisted of 4 one-hour sessions. Craving assessments were carried out from all the participants at baseline and after 3-

week interventions using Desire for Drug Questionnaire (DDQ) and Obsessive-Compulsive Drug Use Scale (OCDUS).

Results : Repeated measure ANOVA was used to compare the total score and subscales of (DDQ) for 3 time points (instant craving) and (OCDUS) for 2 time points, baseline and post-test (periodic craving). DDQ total score and two first subscales exhibited significant differences, with a significant decrease for EFT group (F (1.13) = 4.67, P< 0.001). The results also demonstrated that scores in "Desire and Mental Preoccupation with Drugs" sub-scale of OCDUS were significantly lower after receiving the CIREF intervention (F (1.12) = 14.55, P< 0.001). However, there was no significant difference in the total score of periodic craving.

Conclusion : Overall, our findings suggest that CIREF may attenuate the instant craving, and therefore, have positive therapeutic impacts on the desire and intention to use drugs. Furthermore, the retention rate of participants during the period of intervention offers preliminary support for the feasibility of the intervention. Our results confirmed that CIREF may therefore have the potential to be used as a supplementary cognitive intervention for those who receive MMT in outpatient clinics.

Keywords : Episodic future thinking; Craving; Delay discounting; Opioid; Methadone maintenance treatment

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Count: 31
Abstract ID: 190
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

Willingness To Pay for Drug Use Disorder Treatment from Cost payers' Viewpoints: The Function of Income of Cost Payers and Severity of Addiction of Patients

Submission Author: Samaneh Ahmadian Moghadam

Samaneh Ahmadian Moghadam[1], Ali Mazyaki[2], Emran M Razaghi[3]

1. Assistant professor, Department of Addiction Studies, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran
2. Assistant Professor, Department of Economics, Allameh Tabataba'i University, Tehran, Iran.
3. Associate Professor, Department of Psychiatry, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

Background and Aim : : Traditional economic studies in the field of drug use disorder treatment have generally focused on standard evaluation of costs and benefits of treatment programs. Willingness to pay (WTP) as a subjective economic indicator, however, uncovers intangible benefits of treatment that are not gauged by traditional measurements.We aim To examine the effect of cost payers' income and severity of drug use disorder on WTP for treatment

Methods : Addiction Severity Index questionnaire was used for 109 patients with drug use disorder of which 78 were on Methadone Maintenance Treatment (MMT) and 31 were in abstinence-based residential facilities (RFs). cost payers (family members and patients)' WTP was measured by contingency valuation method. income of cost payers and addiction severity indexes of patients were analyzed in relevance to WTP in a regression model. We also used Kruskal-Wallis and Mann-Whitney statistical tests to examine differences in the two different treatment settings (MMT clinics, RFs).

Results : In MMT clinics higher income and a higher substance use index were associated with a higher WTP, 31.8% (p = 0.005) and 28% (p = .024) respectively. Also, the worse grades in clients legal (22.2%, p = 0.046) and medical status (27.5%, p = 0.022) were associated with a lower WTP. In RFs, on the other hand, cost payers' income (43.6%, p = 0.028) was the sole determinant of WTP for treatment.

Conclusion : In a situation where clients and their families bear the full cost of treatment, income of cost payers plays a key role in preparedness for purchasing treatment services. Severity of drug use disorder is the second factor determining WTP for treatment.

Keywords : Willingness to Pay, Addiction Severity, Drug Use Disorder Treatment, Methadone Maintenance Therapy, Residential Facilities, Iran.

Count: 32
Abstract ID: 62
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

The effect of methadone therapy and treatment counseling on the improvement of psychiatric problems in people using chemical and traditional drugs: clinical trial

Submission Author: Sami Tayebi

Sami Tayebi[1]

1. Master's degree in clinical psychology, addiction therapist, Islamic Azad University, Gorgan branch, Iran.

Background and Aim : Methadone is used as one of the biological treatments for detoxification and maintenance treatment of opioid and opioid addiction. The cheapness of methadone along with its high power in controlling the physical and mental conditions of substance dependence has made it a useful drug in the treatment of addicts. The aim of this study is to improve and compare the psychiatric problems of people using chemical and traditional drugs through methadone treatment and therapeutic counseling for 6 months.

Methods : Examining the files of 50 patients using chemical substances (ecstasy, sedatives and hypnotics, hallucinogens) and traditional substances (opium, sap, burnt opium) who were under methadone treatment from 5/1/1400 to 11/30/1400 and therapy counseling at Armaghane Tandorosti Clinic. The improvement of their psychiatric problems before treatment and after treatment were investigated and compared. Data were analyzed using Prism Ver 8 and paired t and Wilcoxon statistical tests.

Results : Before the treatment, people using the chemical category had acute disorders such as: sleep disorder, psychosis, depression, suicide, loss of interests and impatience, severe aggressive behavior and self-harm, and people using the traditional category had symptoms Such as: impatience, sleep disorder, loss of individual identity, social aversion, in some cases are aggressive behaviors. With the start of methadone therapy within a period of six months, disorders such as depression, aggressive and suicidal behaviors in people who use chemical substances, and symptoms such as impatience and recognition of one's identity and social aversion in people who use traditional drugs improve by about 40%. Therefore, in the second group of people who were simultaneously treated with methadone and counseling, these disorders decreased by about 60%.

Conclusion : Although methadone therapy as a maintenance and alternative treatment reduces psychiatric problems and reduces the desire to use drugs in drug users, combined treatment including methadone therapy and counseling therapy (individual, group, and family) has a significant effect in controlling addiction. Psychiatric problems and strengthening the individual's motivation to not use drugs in people who use drugs.

Keywords : Methadone therapy - therapeutic counseling - addiction – ecstasy- hallucinogenic substances - opium

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Count: 33
Abstract ID: 236
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

Enriched environment and social isolation differentially modulate addiction-related behaviors in male offspring of morphine-addicted dams: The possible role of μ-opioid receptors and ΔFosB in the brain

Submission Author: Neda Yazdanfar

Neda Yazdanfar[1], Alireza Farnam[2], Saeed Sadigh-eteghad[3], Javad Mahmoudi[4], Alireza Sarkaki[5]

1. Neurosciences Research Center, Tabriz University of Medical Sciences
2. Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences
3. Neurosciences Research Center, Tabriz University of Medical Sciences
4. Neurosciences Research Center, Tabriz University of Medical Sciences
5. Persian Gulf Physiology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences

Background and Aim : Prenatal opioids exposure negatively affects the neurobehavioral abilities of children born from dependence dams. Adolescent housing conditions can buffer the detrimental impacts of early life experiences or contradictory can worsen individual psychosocial functions. The present study investigated the effects of maternal morphine dependence and different rearing conditions on behaviors and protein expression in brain reward circuits of male pups.
Methods : Female Wistar rats a week before conception, during pregnancy and lactation were injected twice daily with escalating doses of morphine or saline. On a postnatal day 21, male pups were weaned and subjected to three different environments for two months: standard (STD), isolated (ISO), or enriched environment (EE). The anxiety and drug-related reward were measured using elevated plus maze, open field test, and conditioned place preference. Western blotting was used to determine the protein level of ΔFosB and μ-opioid receptor proteins in the striatum and the midbrain of male offspring, respectively.
Results : Results showed that maternal morphine administration dramatically increased anxiety-like and morphine place preference behaviors in offspring. Also, ISO condition aggravated these behavioral outcomes. While, rearing in EE could attenuate anxiety and morphine conditioning in pups. At molecular levels, maternal morphine exposure and social isolation markedly increased both of ΔFosB and μ-opioid receptor proteins expression. However, rearing in the EE declined ΔFosB protein expression.
Conclusion : Together, these findings help to elucidate long lasting impacts of early life morphine exposure and rearing environment on the behavioral and molecular profile of addicted individuals.
Keywords : Enriched environment, Social isolation, μ-opioid receptor, ΔFosB, Conditioned place preference, Early life morphine exposure

Count: 34
Abstract ID: 321
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

Effect of testosterone on maintenance of morphine-induced CPP: androgen and μ-opioid receptor gene expressions in PFC and NAc of male rats.

Submission Author: Nader Charkhgard

Nader Charkhgard[1], Maryam Zahmatkesh [2], Nasim Vousooghi [3], Maryam Farahmandfar [4], Anahita Torkaman-Boutorabi [5]

1. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
4. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
5. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Rewarding properties of androgens has been suggested. This research aimed to assess the effect of androgen system during the extinction period on morphine induced conditioned place preference (CPP). Androgen and μ-opioid receptor gene expression were also evaluated in PFC and NAc in the male rats.

Methods : CPP was induced by morphine injection (3, 5 and 7 mg/kg, s.c.) for three consecutive days. Testosterone (androgen receptor agonist, 2.5 mg/kg; i.m.) and flutamide (androgen receptor antagonist 10 mg/kg, i.m.) were administered in subsequent extinction period. In 2 castrated groups one group was considered as control and the other one received testosterone during extinction phase. The mRNA expression levels of μ-opioid and androgen receptors in PFC and NAc were evaluated using quantitative real-time PCR (RT-PCR) following CPP reinstatement.

Results : Testosterone prolonged while flutamide shortened extinction period. Castration facilitated morphine-extinction and testosterone could not reverse this effect. The expression of μ-opioid and androgen receptors were increased in PFC and NAc of castrated animals compared to control group which were reversed by testosterone.

Conclusion : In conclusion our results indicated that decreased level of testosterone facilities extinction period in morphine CPP model in male rats. This result could be due to the changes in the expression of opioid and androgenic receptors in PFC and NAc. This study confirms the crucial role of androgen system in modulating drug reward.

Keywords : Androgen, Conditioned place preference, Nucleus accumbens, Morphine, Prefrontal cortex.

the effect of psycho-physiological insomnia model on relative expression of GAD1 and GAD2 in rat's brain regions

Submission Author: FATEMEH KESHAVARZI ARSHADI

FATEMEH KESHAVARZI ARSHADI[1], yaser mansoori[2], mohammad parkhah[3]

1. fasa university of medical sciences
2. fasa university of medical sciences,genetic group
3. kowsar.hospital.shiraz

Background and Aim : sleep deprivation is one of the most fundamental problems in societies affecting mental and physical functions adversely. On the other hand, our information about sleep and sleep deprivation is limited. Neuroimaging investigations reveal that the cortex and hippocampus are influenced by sleep deprivation. ɤ- aminobutyric acid (GABA) and Glutamate are principal neurotransmitters in the brain, playing an important role in the sleep-awaking cycle in various brain regions .Glutamate Decarboxylase (GAD) is an enzyme that catalyzes the decarboxylation of glutamate to GABA. This enzyme has two isoforms, GAD65 and GAD67. This study was conducted based on the significant role of these two enzymes, GAD65 and GAD67, in GABA synthesis, and the importance of this neurotransmitter in regulating the sleep-awakening cycle, as well as brain functions like learning and memory during sleep deprivation. The present study investigates the alterations of GAD1 and GAD2 gene expression in paradoxical insomnia.

Methods : A total of 30 male Wistar rats were received from Fasa medical university animal laboratory with an average weight of 250-300 gr. We performed a multi-platform sleep deprivation method. Five animals were placed on the top of the platform. The tanks were filled with water up to 1cm below the platforms. The experiment began at 9:00 am and rats stayed inside tanks for 72h. After experimental days, rats were sacrificed under deep anesthesia. Their brains were rapidly removed thoroughly and the hippocampus and frontal lobe were dissected. RNA was isolated following the trizol method. We used quantitative real-time-PCR to analyze the expression of these genes and used a Primers sequence was specified for each gene (GAD1&GAD2). At the end of the experiment, rats were sacrificed and their brains were dissected. Hippocampus and frontal cortex were removed and GAD1 and GAD2 gene expression were quantified with real-time PCR. Livak method was used to calculate the comparative expression between the control and SD groups.

Results : Our data were presented by mean and standard deviation. Expression of GAD1 in both regions of rats' brains (hippocampus and frontal cortex) decreased. However, there was no significant comparative relation between the control and SD groups. Our information was shown by mean and standard deviation. Expression of GAD2 in both regions of rats' brains (hippocampus and frontal cortex) subsided and there was no significant comparative relationship between control and SD groups

Conclusion : In conclusion, our results showed that GAD1 and GAD2 gene expression in the cortex and hippocampus decreases but this reduction is not significant. This study was performed to research the effect of the expression of the gene coding GAD enzyme, which is an important enzyme in brain hemostasis. Using the sleep deprivation model, the rats underwent stress-relieving conditions. Given the fact that gene expression of the GAD enzyme did not change significantly during sleep deprivation, and according to the results of previous studies about the effect of this enzyme in controlling stress-induced ailments, such as panic disorder and PTSD, this enzyme can be used for therapeutic purposes and sleep deprivation problems.

Keywords : sleep,sleep-deprivation,cortex,hippocumpus

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 36
Abstract ID: 223
subject: Neuropsychiatry and Psychology: Functional Neurological Symptom Disorder
Presentation Type: Oral

Evaluation of the effect of Fingolimod on physical, cognitive and psychological aspects of Huntington disease

Submission Author: Seyed Kianoosh Naghibzadeh

Seyed Kianoosh Naghibzadeh[1], Fatemeh Firouzan[2], Bita Shalbafan[3]

1. Master Student of Faculty of Biological Sciences,Tarbiat Modares University,Tehran,Iran Modares University
2. Master Student of Faculty of psychology and educational Sciences,Shahid Beheshti University,Tehran,Iran
3. Neurologist Researcher ,Clinical Research Development Unit of Labbafinejad hospital,Shahid Beheshti University of Medical Sciences

Background and Aim : Huntington's disease (HD) is a hereditary neurodegenerative disorder characterized by motor and cognitive impairments, involving the striatum, cortex, and hippocampus. There is currently no cure and no way to stop or even slow the brain changes it causes. Synaptic and memory dysfunction in HD have been related to low levels of brain-derived neurotrophic factor (BDNF), in addition, astrocyte over-activation has also been suggested to contribute to HD cognitive deficits. The approval of the immunomodulatory drug fingolimod (FTY720) to treat multiple sclerosis has prompted investigators to explore the potential benefits of this drug in other neurological diseases. Fingolimod as a modulator of sphingosine-1 phosphate (S1P) receptors has been shown to increase BDNF levels and reduce astrogliosis, proving its potential to regulate trophic support and inflammatory response.

Methods : In this study, the neuropsychological performances were assessed in a 27 years old man with Huntington disease that was genetically diagnosed in family screening. The Cambridge Neuropsychological Test Automated Battery (CANTAB) assessment was repeated 3times in 13 months of fingolimod administration (pre-test, 6 months, and 13 months after administration). CANTAB tests have demonstrated sensitivity to detecting changes in neuropsychological performance and include tests of working memory, learning and executive function; visual, verbal, and episodic memory; attention, information processing and reaction time; social and emotion recognition, decision making, and response control.

Results : An improvement in performance across baseline in Paired Associates Learning task (PAL) (>10 errors) that assesses visual memory and new learning at 6 and 13 months after fingolimod administration. Little, or no change across the remainder of tests: One Touch Stockings

(executive function test), Reaction Time (motor and mental response speed and, response accuracy and impulsivity), and Spatial Span (visuospatial working memory capacity).

Conclusion : The present case study suggests that the first approved oral therapy for multiple sclerosis, fingolimod may be effective in HD patients and eventually constitute an alternative therapeutic approach for the treatment of the disease.

Keywords : Huntington disease; Fingolimod; CANTAB; Cognition

Count: 37
Abstract ID: 109
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Oral

Anticonvulsant activity of a ghrelin receptor inverse agonist in the electrical kindling model of epilepsy

Submission Author: Siamak Beheshti

Siamak Beheshti[1], Fatemeh Zamani[2]

1. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan
2. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran

Background and Aim : Studies have shown that the ghrelin peptide is involved in the generation of seizures and epilepsy. We assessed the effect of blocking the constitutive activity of the ghrelin functional receptors in the amygdala on seizures induced by the electrical kindling.

Methods : Twenty-four adult male rats were used. A tripolar electrode twisted with the guide cannula, and two monopolar electrodes were implanted into the basolateral amygdala or the surface of the skull using stereotaxic surgery. One week after surgery, the threshold was determined in the animals. 24 hours afterward, the animals received six stimuli daily with the threshold intensity until the generation of three consecutive stage 5 seizures. Then, saline, and 24 hours afterward, a ghrelin receptor inverse agonist (D-Arg1, D-Phe5, D-Trp7,9, Leu11]-Substance P) was injected at three doses (50, 500, 5000 ng/rat) into the amygdala. Thirty minutes after injection of the drug or its solvent, seizure parameters, including after-discharge duration (ADD), seizure stage (SS), and stage 5 duration (S5D), were recorded.

Results : The results indicated that blocking the constitutive activity of the ghrelin receptor had anticonvulsant activity, showed by a dose-dependent decrease in ADD and S5D. However, D-Arg1, D-Phe5, D-Trp7,9, Leu11]-Substance P did not affect SS, significantly.

Conclusion : In conclusion, it seems that the spontaneous signaling of the ghrelin receptor in the amygdala modulates the propagation of generalized seizures in the kindling model of epilepsy.

Keywords : Ghrelin receptor, Seizure, Electrical kindling, Epilepsy, Amygdala

Count: 38
Abstract ID: 116
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Oral

Chronic orexin-1 receptor blockage decreases hippocampal theta and gamma band power in a rat model of depression

Submission Author: Batoul Mirbolouk

Batoul Mirbolouk[1], Kambiz Rohampour[2], Behrooz Khakpour-Taleghani[3], Adele Jafari[4], Mohammad Rostampour[5]

1. Department of Physiology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
2. Department of Physiology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
3. Department of Physiology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
4. Department of Physiology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
5. Department of Physiology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran

Background and Aim : Orexin neurons play a critical role in stress-related psychiatric disorders, including: depression. Depression is a major contributor to disability globally, and it frequently follows exposure to chronic moderate stress (CMS). This study focused on the role of orexinergic system in modulating reward-related behavior and investigating the alterations in electrophysiological characteristics in the hippocampus (HPC) and prefrontal cortex (PFC).

Methods : Wister rats weighting 250-310 g were divided into six experimental groups (n=7); Control, CMS, acute SB-334867 (SB), CMS+SB, chronic SB (CSB) and CMS+CSB. CMS treated rats were exposed to different types of unpredictable mild stressor for twenty-one days. Intracerebroventricular (icv) injection of SB-334867, a selective Orx1R antagonist, was performed either 30 min before the tests (acute) or once daily for 14 days (chronic). On the 23rd day, raw LFP waves were recorded at a sample rate of 10 kHz from the HPC and PFC regions. The acquired data was filtered by a band-pass filter of 1-100 Hz. Spectral power and HPC-PFC connectivity were calculated using Matlab software. Also, behavioral tests were taken on the first, eleventh, and twenty-second days to confirm the development and maintenance of depression.

Results : The results indicate that chronic orexin-1 receptor blockage caused a significant decrease in theta and gamma band power, both in the hippocampus (P≤0.05), and the prefrontal cortex (P≤0.05) in rat model of depression. In depressed animals, the HPC-PFC connectivity decreased in the delta band range, while an increased connectivity was observed in the gamma band range

(P≤0.05). Chronic SB treatment boosted the connectivity in high gamma range (P≤0.01). The results of behavioral tests confirmed the development of depression by CMS treatment.

Conclusion : Hence, the results of this study suggest that chronic antagonism of orexin-1 receptor besides alleviating depressive behaviors can potentiate the delta and gamma band power and also increase hippocampal-prefrontal connectivity in high gamma band range.

Keywords : Chronic mild stress; Depression; Orexin; Orexin receptor-1; Local field potential; Spectral power, connectivity.

Count: 39
Abstract ID: 176
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

The effect of different foot electrical stimulation intensities on kindling induced by pentylenetetrazole in Wistar rats

Submission Author: Salahuddin Zarei

Salahuddin Zarei[1] Mohammad Reza Palizvan[2]

1. MSc, Dep t. of Physiology, Arak University of Medical Sciences, Arak, Iran, ORCID: 0000 -0002 -4677 - 2634
2. Prof., Dep t. of Physiology, Arak University of Medical Sciences, Arak, Iran, ORCID: 0000 -0001 -7655 - 944X (Corresponding Author) Tel: (086) 34173520, Fax: (086) 34173521, E-Mail: Palizvan@yahoo.com

Background and Aim : Epilepsy is a destructive neurological disorder in the CNS that affects a person throughout life and is caused by an imbalance in stimulation and inhibition. Antiepileptic drugs (AEDs) are used to treat epilepsy,but about30% of cases have drug resistance.These drugs also have significant side effects on learning and memory.According to studies,mild foot electrical stimulation(MFES) can prevent the progression of epilepsy in rat But if epilepsy developed,it had no effect on kindled mice.This study tries to investigate the cause of this and answer the question whether this lack of effect can be due to stimulus parameters?

Methods : 70male Wistar rats weighing between200 to250 gr were randomly divided into7 groups of10, including a control group, a phenytoin group, and 5 experimental groups. To induce kindling in all groups, Pentylenetetrazole(PTZ) was injected every48 hours at intervals of13 days(13 injections) at a dose of37.5 mg/kg. The first group or the control group did not receive electrical stimulation and PTZ injection for26 days,after which PTZ injection was performed every48 hours for4 days(2 injections). second group or the phenytoin group, did not receive electrical stimulation and PTZ injection for26 days, and then every48 hours for4 days(2 injections) one hour before receiving PTZ, they received30 mg/kg phenytoin.Electrical stimulation of the animals' feet were exposed to an electric wave (intensity of 0.2 to 1 mA depending on the experimental group) which was 160 ms in length and 160 ms in duration and the total duration of stimulation was 20 minutes. The third to seventh groups were kindled rats that after kindling for 26 days every 48 hours (13 times) had electrical stimulation of the sole of the foot at the levels of 0.2, 0.4, 0.6, 0.8 and 1 mA without PTZ injection. Then, at intervals of 48 hours and for 4 days (2 times), they first received electrical stimulation with the mentioned intensities and one hour later, PTZ was injected in them. In all groups after PTZ injection to evaluate seizure behaviors in animals, their behavior was evaluated up to 30 minutes after drug injection.

Results : According to the observations made, foot electrical stimulation with different intensities of 0.2 to 1 mA was able to control convulsive variables to a large extent with phenytoin. Meanwhile, electrical stimulation of 0.2 mA and 0.4 mA was able to significantly increase the time to reach the second stage of seizure (S2L). Electrical stimulation of 0.6 mA was able to increase S2L and significantly reduce the seizure phase (SS) and the length of time spent in phase 5 seizure (S5D). Electrical excitation of 0.8 mA was able to significantly increase S2L and time to stage 5 seizure (S5L) and decrease SS and S5D. Electrical excitation of 1 mA was also able to significantly increase and decrease S2L and SS, respectively. Phenytoin also increased S2L and significantly decreased SS and S5D.

Conclusion : MFES and phenytoin can inhibit seizures in PTZ-kindled rats. but, the effect of electrical stimulation is more significant at 0.6 and 0.8 mA. Also, the anticonvulsant effect of electrical stimuli is More lasting than phenytoin

Keywords : Kindling, PTZ, foot electrical stimulation, epilepsy

Count: 40
Abstract ID: 195
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Investigating the effect of stress during pregnancy on the testosterone blood level, DNA damage, and sperm parameters in first generation pilocarpine-treated male rats

Submission Author: Ramin Ahmadzadeh

Ramin Ahmadzadeh [1], Samaneh Ahmadian_Moghadam(MD,PhD)[2], Shiva Roshan-Milani(MD, PhD)[3], Ehsan Saboory[4]

1. PhD candidate, Department of reproductive biology, Faculty of Modern Medical Sciences, Tabriz University of Medical Sciences
2. Assistand professor, Department of addiction studies, School of Medicine, Zanjan University of Medical Sciences
3. Professor, Department of physiology, School of Medicine, Urmia University of Medical Sciences
4. Professor, , Department of addiction studies, School of Medicine, Zanjan University of Medical Sciences

Background and Aim : stress during pregnancy causes unusual neuronal connections in the fetal development which leads to seizure potentiation and alteration in activity of endocrine glands. In the current study, the effect of maternal immobility stress during pregnancy on sperm parameters, testosterone blood level, and sperm DNA damage was investigated in first-generation pilocarpine-treated male rats.

Methods : : Pregnant rats (180-220 g) were divided in two groups (n=6 each): control and stress. In the stress group, the rats were kept immobile on the 15th day of pregnancy by restrainer twice a day, for one hour, and up to 3 consecutive days. After birth, the pups were counted and divided between dams, evenly. Each dam with her pups kept in a separate cage in standard conditions. On the 25th day after birth, pilocarpine (150 mg/kg.s.c) was injected to the male pups of both groups to induce epileptic behaviors. Then, the subjects were kept in standard conditions until Puberty. On 70th day after birth, the subjects were anesthetized and studied in terms of sperm count, motility, sperm DNA damage, and testosterone blood levels.

Results : The mean of testosterone blood levels, number and percentage of sperm motility in the epileptic stress group decreased significantly compared to the control group. While, the mean of sperm DNA damage was significantly increased in the epileptic stress group compared to the epileptic control group.

Conclusion : Stress during pregnancy potentiates long-term convulsions in offspring and can increase reactive oxygen species (ROS) in the body. Then, oxidative stress caused by ROS probably leads to reduction of sperm DNA damage and reduction of sperm motility by lipid peroxidation and peroxidation of unsaturated fatty acids of sperm plasma membrane.

Keywords : gestational restraint stress; testosterone hormone; sperm DNA damage; sperm parameters; seizure

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Inhibitory effect of Pam3Cys on epileptic behavior of rats following brain injury

Submission Author: Hanieh Javid

Hanieh Javid[1], Bahar khoshkroodian[2], Hamid Gholami Pourbadie[3], Mohammad Sayyah1[4]

1. Department of Physiology and Pharmacology, Pasteur Institute of Iran, Tehran, Iran
2. Department of Physiology and Pharmacology, Pasteur Institute of Iran, Tehran, Iran
3. Department of Physiology and Pharmacology, Pasteur Institute of Iran, Tehran, Iran
4. Department of Physiology and Pharmacology, Pasteur Institute of Iran, Tehran, Iran

Background and Aim : Post-traumatic epilepsy (PTE) is characterized by unprovoked and recurrent seizures occurring at least one week after traumatic brain injury (TBI). There is no available antiepileptogenic cure for PTE and any treatment strategy for optimal seizure control is highly demanded. Toll-like receptors (TLRs), activated by cellular damaged molecules, play an important role in the neuroinflammatory process that occurs in epilepsy. TLR agonists, tri-palmitoyl-S-glyceryl-cysteine (Pam3Cys), is a bacterial lipopeptide existing in prophylactic human vaccines. In the current study, we assessed the impact of post-treatment Intra cerebroventricular injection of Pam3Cys on epileptogenesis in the pentylenetetrazole (PTZ) kindling model in male rats.

Methods : A controlled Cortical Impact (CCI) device was used to induce TBI then a dose (0.01 µg/rat) of Pam3Cys was injected into the cerebroventricular of rats by stereotaxic surgery. 24 h after induction of TBI, rats received intraperitoneal injections of PTZ 35 mg/kg once every other day until the acquisition of generalized seizures.

Results : Rats after TBI induction became kindled by the lower number of PTZ injections in comparison with the control group without TBI. Kindling on rats receiving Pam3Cys immediately after TBI was induced by a higher number of PTZ injections similar to the sham group indicating its effect on the prevention of seizure acceleration rate after brain trauma.

Conclusion : Pam3Cys could reduce seizure susceptibility induced by brain trauma. Thus, it could be considered a possible therapeutic candidate for the development of antiepileptogenic drugs used after TBI state.

Keywords : Pam3Cys, Pentylenetetrazole kindling, Controlled cortical impact, Toll-like receptor, Traumatic epilepsy

Count: 42
Abstract ID: 215
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Neurostimulation as a Putative Method for Treatment of Drug-Resistant Epilepsy in Patient and Animal

Submission Author: Nooshin Ahmadirad

Nooshin Ahmadirad[1]

1. Cellular and Molecular Research Center, Iran Medical University sciences

Background and Aim : Epilepsy is a chronic disease of the brain considered by a permanent tendency to generate seizures, consequently neurobiological, psychological, cognitive, and social problem was demonstrated in patient following recurrent seizure. However, despite numerous drug treatments, approximately, 30–40% of all patients are resistant to antiepileptic drugs. Therefore, newer therapeutic modalities are introduced into clinical practice in which involve neurostimulation and direct stimulation of the brain. Hence, we review published literature regarding the vagus nerve stimulation, trigeminal nerve stimulation, applying responsive stimulation systems and deep brain stimulation, in animals and epileptic patient with an emphasis on drug-resistant epilepsy.

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Keywords : Drug-resistant epilepsy, Vagus nerve stimulation, Trigeminal nerve stimulation, Responsive stimulation system, Deep brain stimulation

Count: 43
Abstract ID: 274
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

The neuroprotective, anticonvulsant and antioxidative effects of alpha-pinene in kainate murine model of temporal lobe epilepsy: Involvement of mitochondrial apoptotic pathway and JNK activity

Submission Author: Paria Hashemi

Paria Hashemi[1], Shamseddin Ahmadi [2]

1. Department of Biological Science, Faculty of Science, University of Kurdistan, Sanandaj, Iran
2. Department of Biological Science, Faculty of Science, University of Kurdistan, Sanandaj, Iran

Background and Aim : The most frequent kind of partial epilepsy leading to recurrent spontaneous seizures and neural degeneration, mainly in the hippocampus, is temporal lobe epilepsy (TLE). Oxidative stress and apoptosis play pivotal roles in triggering and developing repeated seizures as well as neuronal death following seizures. Anticonvulsant, antioxidative, and neuroprotective properties of alpha-pinene (APN) have been reported in some experimental models of neurodegenerative diseases. However, its neuroprotective efficacy in a rat model of TLE induced by kainic acid (KA) has remained unexplored. We aimed to find out the outcomes of an APN pretreatment for two weeks on epileptic behaviors, neuronal damage, oxidative stress, and apoptosis in a rat model of TLE.

Methods : Male Wistar rats (n = 70) were randomly distributed into five experimental groups as follows: (1) Control-vehicle; (2) Dimethyl sulfoxide (DMSO 5%)-pretreated + sham; (3) APN (50 mg/kg)-pretreated + sham; (4) kainic acid (KA), and (5) APN (50 mg/kg)-pretreated + KA groups. TLE was induced by unilaterally intracerebroventricular microinjection of KA. APN pretreatment at a dose of 50 mg/kg/day was intraperitoneally performed two weeks before induction of TLE. The neuronal cell loss in the CA3 region of the hippocampus was evaluated by Nissl staining. The hippocampal levels of oxidative stress markers, such as malondialdehyde, total antioxidant capacity, and total oxidant status were measured. The protein levels of Bax, Bcl-2, and c-Jun N-terminal kinase (JNK) were also assessed using by western blotting method.

Results : The results revealed that APN pretreatment alleviated epileptic seizures, diminished oxidative stress indicators, prevented neuronal death in the CA3 region, and blocked the mitochondrial apoptotic pathway via decreasing Bax and raising Bcl-2 protein levels in the hippocampus at least partly through inhibiting JNK activity. Significance: These findings suggest

that APN pretreatment mitigates KA-induced seizures through blocking neuronal damage, oxidative stress, apoptosis, and attenuation of the JNK activity in the hippocampus.

Conclusion : These findings suggest that APN pretreatment mitigates KA-induced seizures through blocking neuronal damage, oxidative stress, apoptosis, and attenuation of the JNK activity in the hippocampus.

Keywords : Epileptic Seizures, CA3 Region, Neuroprotection, Bax Protein, Bcl-2 Protein

Count: 44
Abstract ID: 149
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Comparison of intranasal and intraperitoneal administration of Eugenia caryophyllata (clove) essential oil on spatial memory, anxiety-like behavior and locomotor activity in a pilocarpine-induced statu

Submission Author: Fateme Parvizi

Fateme Parvizi[1], Maryam farahmanfar[2]

1. -
2. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Epilepsy induces behavioral efects and histological changes in the hippocampus. Eugenol, the main component of clove essential oil, has modulatory efects on seizure. We aimed to investigate the efect of intraperi- toneal (IP) and intranasal (IN) clove essential oil on cognitive and histological changes during the chronic phase of temporal lope epilepsy.

Methods : Male Wistar rats were divided into eight groups of seven including control, pilocarpine (PLC), clove oil (IP and IN), sesame oil (IP and IN), phenobarbital (positive control) and saline. Rats were injected with 350 mg/kg PLC to induce status epilepticus (SE). We evaluated the efects of 14 days IP (0.1 ml/kg) and IN (0.02 ml/kg) administration of clove essential oil on locomotor/explorative activity, anxiety-like behavior, spatial recognition memory, and hyperex- citability, as well as hippocampal cell survival in PLC-treated rats.

Results : Our fndings indicated that clove oil could efectively ameliorate PLC-induced behavioral defcits, and also alleviate neuronal death in the cornu ammonis 1 (CA1) region of the hippocampus. Behavioral results as in the Y-maze, Open feld and elevated plus maze featured signifcant diferences between control and treated groups. Post- seizure behavioral battery (PBSS) results explicated that behavioral hyperexcitability were less in clove oil groups (both IN and IP) compared to PLC-treated rats. Moreover, results of this study demonstrated that IN administration of clove oil was more potent in alleviating behavioral impairment at a lower dosage than by IP route. The results of this study, also demonstrated that intranasal administration of clove oil could reduce duration of recurrent seizures

Conclusion : In summary, clove oil treatment ameliorated histopathological and behavioral consequences of PLC- induced SE.

Keywords : Clove essential oil, Eugenol, Intranasal, Seizure, Anticonvulsant, Persian medicine

Count: 45
Abstract ID: 445
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Insilico studies to find microRNA(s) regulating HCN1 mRNA in mouse and human hippocampus

Submission Author: Sanaz Khatami

Sanaz Khatami[1], Dr Mohammad-Javad Eslamizadeh[2], Dr Samira Mohammadi-yeganeh[3]

1. Department of Medical Biotechnology, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Biochemistry, McGill University, Montréal, Québec, Canada
3. Department of Medical Biotechnology, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Epilepsy is a common and serious neurological disorder characterized by recurrent spontaneous seizures. Pharmacotherapy is one of the common treatments, including anticonvulsant drugs that usually target ion channels and neurotransmitter systems, but these drugs fail in 30% of patients and do not prevent the development or progression of epilepsy. HCN1 proteins form an important part of voltage-dependent ion channels in the brain, while playing an important role in the excitability of neurons, are downregulated in the brains of patients with treatment-resistant epilepsy. Research has shown that the differential expression of HCN1 proteins is involved in the pathophysiology of epilepsy. On the other hand, microRNAs (miRNAs) are a family of small non-coding RNAs that control the expression level of numerous proteins by reducing stability and suppressing mRNA translation, and therefore they can be key regulatory mechanisms and therapeutic targets in epilepsy. An emerging therapeutic target is interfering with miRNAs, Their multi-target function offers unique advantages for certain forms of epilepsy with complex pathophysiology, such as temporal lobe epilepsy (TLE). The aim of this project was finding HCN1-matched miRNAs that potentially could be the cause of HCN1 hypo-expression through bioinformatics studies so that it can be used in the future to treat epilepsy, especially treatment-resistant epilepsy.

Methods : To perform the bioinformatics process, the latest version of Target Scan and other prediction databases have been used to find and prioritize microRNAs with complementary seed region(s) paired with the HCN1 mRNA 3´UTR region of mouse and human. Validation databases as well as microarray data available in ArrayExpress/GEO have been used to confirm the results of bioinformatics prediction so that candidate miRNAs are finally selected. Based on these results, 3 to 5 miRNAs whose total score was the highest in these servers and have the most criteria such

as free energy (ΔGduplex), conserved seed region, and z-score are selected for future experimental studies.

Results : By bioinformatics studies with the mentioned servers, finally miR-134, mir-141a, mir-126, mir-135, and mir-133 were chosen to target HCN1.

Conclusion : we used several databases and miRNA estimation softwares to estimate the target miRNAs. Our bioinformatics approach indicated that selected miRNAs by targeting HCN1 gene can have the potential to inhibit HCN1 expression.

Keywords : Bioinformatic; HCN1; microRNA; TargetScan;

Count: 46
Abstract ID: 495
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

The effect of GABAergic neurotransmission on the seizure-related activity of the laterodorsal thalamic nuclei and the somatosensory cortex in a genetic model of absence epilepsy

Submission Author: Maryam Jafarian

Maryam Jafarian[1]

1. brain and spinal cord injury research center, neuroscience institute, Tehran university of medical sciences, Tehran,Iran

Background and Aim : The present study aimed to investigate the alterations of the GABAergic system in the laterodorsal nucleus (LDN) of the thalamus and the somatosensory cortex (SC) in an experimental model of absence seizure. The effects of pharmacological manipulation of both GABAA and GABAB receptor subunits in the LDN on the generation of spike-wave discharges (SWD) were evaluated

Methods : The experiments were carried out in four groups of both WAG/Rij and Wistar rats with 2 and 6 months of age. The expressions of various GABA receptor subunits were studied in the LDN and SC. Furthermore, recordings of unit activity from the LDN and electrocorticography were simultaneously monitored before, during, and after the application of GABAA and GABAB antagonists in the LDN

Results : The generation of SWD in the older WAG/Rij rats was associated with significant alterations in the expression of GABAARα1, GABAARβ3, and GABABR2 subunits in the LDN as well as GABAARα1, GABAARβ3, GABAARγ2, and GABABR2 subunits in the SC. Furthermore, the occurrence of SWD was associated with a significant reduction of gene expression of GABAARα1 and increase of GABAARβ3 in the LDN as well as reduction of GABAARα1, GABAARβ3, GABAARγ2, and GABABR2 in the SC. The microionthophoretic application of the GABAA antagonist bicuculline resulted in a significant increase in the population firing rate of LDN neurons as well as the mean number and duration of SWD. The application of the GABAB antagonist CGP35348 significantly increased the population firing rate of LDN neurons but decreased the mean number of SWD.

Conclusion : Our data indicate the regulatory effect of the GABAergic system of the LDN and SC in absence seizures.

Keywords : seizure, Brain Neurotransmission, Synapse, Limbic system, Cognition

Count: 47
Abstract ID: 331
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

Artificial Intelligence for Brain Communication with Artificial Neurons: A New Brain-Machine Interfaces

Submission Author: Nasibeh Rady Raz

Nasibeh Rady Raz[1], Mohammad Taghi Joghataei[2]

1. Department of Artificial Intelligence in Medicine, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran; Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Artificial neurons bring great hope to the paralyzed world and make the scope of Brain-Machine Interfaces (BMI) wider for prosthetic limbs, implants, and robotics. Artificial neurons are organic electrochemical printed circuits that should be soft, biocompatible, biodegradable, and can take shape easily. In this paper, we review the effect of Artificial Intelligence (AI) on brain communication with artificial neurons.

Methods : Recently, artificial neurons for making artificial synapses have become a hot research topic. For example, artificial neurons capable of receiving and releasing the neurotransmitter dopamine for communication with the brain through chemical media is presented. These artificial neurons perform adaptive interaction in a mouse leg and robotic hand. One of the significant issues in artificial neurons is the mismatch between messengers of biological systems with artificial organs. Since biological systems work with their chemical-based interneuron messengers while artificial organs work with their electrophysiological signals. Carbon-based electrochemical sensors and a memristor with synaptic plasticity are used to solve this issue. Also, neuromorphic computing, in which electronic circuits aim to mimic neuro-biological architecture, helps develop this domain. These chips are used to model perception, motor control, or multisensory integration. Using memristors and ferroelectric field-effect transistors for producing uncertain non-linear spikes, artificial neurons are presented. Applying machine learning leads to a model closer to the human brain for performing high-level brain functions, i.e., imagination and inference. Artificial neurons are presented as medical implants and bio-electronic devices for curing chronic diseases like Alzheimer's. This research explains how neurons respond to electrical stimuli through derived equations. Furthermore, artificial neurons are used for decoding brainwaves. It is performed for epilepsy patients and recognizes brain regions that cause epileptic seizures.

Results : AI facilitates and performs computation for brain communication with artificial neurons.

Conclusion : AI helps the progress of novel BMIs by performing smart computation e.g., by brain communication with artificial neurons. In this research, we review the state-of-the-art novel brain-neuron BMIs.

Keywords : Artificial Intelligence ; Brain-machine Interfaces ; Artificial Neurons

Count: 48
Abstract ID: 361
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Oral

Introduction of the candidate targets and pathways related to multiple sclerosis by systems biology method

Submission Author: Hamideh Asadinezhad

Hamideh Asadinezhad[1], Ardeshir Nabizadeh[2]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : The human body is made of different systems and very complex molecular processes. In fact, in the body, the communication and networks between molecules can be in charge of controlling the body's function. System biology is a science that assembles models of biological systems on information collected over the years and in various research works. It clarifies the relationship between the cellular regulatory metabolites of the body. This method also decodes the link between genotype and phenotype, and on the other hand, it determines the changes in gene expression in disease, disease-related genes, the relationship between these genes, and disease-related pathways. Considering the time and cost of research work, this method is used to find suitable targets and pathways related to each disease with more certainty, as well as find new targets and research innovations.

Methods : In this research, the primary data was received from the gene expression omnibus data center, then the changes in gene expressions were analyzed by the r program. After selecting the desired genes with excel software, genes with higher quantity named centrality were selected by Cytoscape and Gephi software. Also, the proposed pathways related to the information obtained from the analyzes were found in Enrichr. Drug Bank and Therapeutic Target Database were used to check the drugs that fit the proposed targets.

Results : In this method, by using the information obtained from many reliable databases, genes that had changes in expression in patients with multiple sclerosis were found, and after analyzing the data at different levels and with special software, genes with higher amounts of centrality were found, also the network between genes (nodes) was determined, so nodes with more connections were introduced, on the other hand, new pathways were introduced for multiple sclerosis based on these targets, and finally, some drugs suggested as potential candidates for the treatment of this disease According to the targets that were selected in the last stage.

Conclusion : Multiple sclerosis is a progressive and debilitating disease among young people, especially women, and since no definitive treatment has been found for this disease, the use of systems biology methods to investigate genes and find new targets, as well as possible pathways, can be a step to get closer to the improvement of these patients. On the other hand, due to the long process of designing and supplying each drug, suggesting some drugs, among the ones available in the market, according to the analyzes performed, can be helpful for these patients' treatment by imposing less social costs and in less time.

Keywords : System biology; Multiple sclerosis; genes

Count: 49
Abstract ID: 8
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Oral

In-Silico interactions of some neuroprotective compounds with key proteins involved in memory impairment; the future perspective

Submission Author: Auob Rustamzadeh

Auob Rustamzadeh[1], Fatemeh Moradi[2], Nader Sadigh[3], Zahra Vahabi[4], Nafiseh Mohebi[5], Armin Ariaei[6]

1. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
3. Department of Emergency Medicine, Trauma and Injury Research Center, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
4. Department of Geriatric Medicine, Ziaeian Hospital, Tehran University of Medical Sciences, Tehran, Iran.
5. Department of Neurology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
6. Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Memory impairment is a result of multiple factors including amyloid-beta (Aβ) accumulation. Several receptors are mediated for Aβ transport and signaling. Moreover, blood lipids are involved in Aβ signaling pathway through these receptors. Mediated blood lipid level by statins aims to regulate Aβ signaling cascade.

Methods : The structure of receptors was taken from the RCSB PDB database and prepared with MGLTools and AutoDock tool 4. Second, the ligand was prepared for docking through Autodock Vina. The binding affinity was calculated and the binding sites were determined as well as the bond type and their position through LigPlot software. The mode and the place of interaction in the three-dimensional structure of key bioactive and natural compounds (i.e. Atorvastatin, Donepezil, Legalon, Memantine, Quercetin, and Rosuvastatin) interact with various types of neurodegenerative induce proteins (including APP, Aβ1-42, Tau, LRP1, RAGE, and p-glycoprotein acetylcholinesterase (AChE)) were investigated. Finally, pharmacokinetic properties were calculated through multiple software and compared to Donepezil and Memantine along with a comparison with in vivo studies

Results : Our analyses revealed Legalon, the trade name for Silymarin, as a potential compound in interaction with the fibril form of A?1-42 and monomer form of A?1-40. Moreover, other statins, especially Silymarin, can interact with several transporters including RAGE, ABCA1, P-

glycoprotein, and even TNF-? as an inflammatory factor. Finally, pharmacokinetics properties show somehow similar attitudes of statins compared to in vivo studies, except for the reproductive system hazardous of Atorvastatin and tumorigenic property of Quercetin. Binding site analysis of AChE highlighted quercetin and Legalon as effective compounds for inhibiting the enzyme's activity. Legalon makes 13 hydrophobic and 7 hydrogen bonds, while quercetin makes nine hydrophobic and seven hydrogen bonds. Since quercetin has a significantly high binding affinity new synthesis compounds should focus on making hydrogen bonds. Effective amino acids for making these bonds are Histidin 447 and 405, Glutamic acid 202 and 313, Asparagine 87, tyrosine 72, Aspartic acid 74, Serine 125, Glutamine 71, Threonine 311, and Glycine 240. Among ligands presented in this study, only Legalon has a high binding affinity for APP. Statins especially Rosuvastatin strongly bind to RAGE, P-glycoprotein, and ABCA1. These receptors interact with A? and are known to involve in its transport and clearance.

Conclusion : RAGE as a receptor transporting Aβ into the CNS and P-gp as a crucial mediator in Aβ signaling can be efficiently inhibited by statins mainly Legalon. AChE can be inhibited by Quercetin more effective than donepezil. In addition, statins can affect other proteins, including Amyloid precursors like protein 2, and TNF-α. Pharmacokinetic properties of statins reveal their ability to peripheral clearance of Aβ since they have a poor BBB penetration rate also some of them (further study needed) including Atorvastatin and Quercetin may have the ability to cause multiple side effects which have not been predicted for common AD medications.

Keywords : Bioinformatics; Pharmacokinetics; Alzheimer disease; dyslipidemia; Amyloid beta; Medication

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 50
Abstract ID: 20
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Oral

Inhibiting the ATP binding site of CK1 δ as an enzyme involved in tauopathy and sleep impairment with novel small molecules; In Silico study

Submission Author: Armin Ariaei

Armin Ariaei[1], Shahram Darabi[2], Setayesh Moradinia[3], Auob Rustamzadeh[4]

1. School of Medicine, Iran University of Medical Sciences and Health Services, Tehran, Iran
2. Cellular and Molecular Research Center, Research Institute for Non-communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran
3. School of Medicine, Iran University of Medical Sciences and Health Services, Tehran, Iran
4. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD), a most prevalent neurodegenerative disease, demands effective medication to alleviate its symptoms. In this study, sleep impairment as an overt clinical symptom, and tauopathy as a prominent molecular symptom of this disease were brought into focus. Multiple enzymes have been suggested to be involved in these symptoms, among them, Ck1δ overexpression could directly phosphorylate tau protein as well as participate in the circadian timing through post-translational modification of CLOCK. CK1δ inhibition lengthens the circadian rhythms for about 2 hours and stabilizes disturbed circadian timing which is caused by overexpression of Ck1δ in the hippocampus during AD. Moreover, inhibiting CK1δ with the PF-670462 improved cognitive performance in AD patients. Unfortunately, up to now, there is less information about potential CK1δ inhibitor compounds, hence, we investigate multiple small molecules to find effective inhibitors of CK1δ.

Methods : To find new inhibitors for the CK1 δ, we scrutinized multiple small molecule libraries (719 compounds; ChemDiv: 366- Chembl: 180- Pubchem: 173). Subsequently, their binding affinity and pharmacokinetics are evaluated by AutoDock Vina and pkCSM, respectively. Since ATP plays a significant role in casein kinases activity, one of our inclusion criteria was the similarity between compounds and ATP binding site and the other was toxicity rate. Four compounds named Lestaurtinib, Repotrectinib, Bemcentinib, and Zotiraciclib were selected for scrutinized analyses of binding sites by LigPlot+ software. Finally, molecular dynamics (MD) simulation was performed on Repotrectinib and Bemcentinib by NAMD software to obtain

detailed information. Protein-protein docking was implemented by Hex software to evaluate drugs' effectiveness in the reduction of tau phosphorylation.

Results : Pharmacokinetics results, with consideration of absorption, metabolism, distribution, toxicity, and exertion, suggested Repotrectinib as a rather safe compound with high potency for oral use, while other compounds should be used as an intravenous drug for maximum effectiveness. Binding site analysis discloses Bemcentinib and Repotrectinib as two inhibitors that occupy most of the amino acids in a bind with ATP. The MD simulation reveals Bemcentinib to have a low impact on the CK1δ conformation measured by root mean square deviation (RMSD) with the overall score of 1.4454 nm, root mean square fluctuation (RMSF) of approximately 0.3 nm, and finally the radius of gyration (RG) with a fluctuation rate of 19.4 to 19.7. Moreover, it discloses higher stability in the system measured by CaFE free binding energy (-38.5019 kJ/mol). While protein to protein docking predicted Repotrectinib to interfere with the tau phosphorylation binding site in an inhibition way more than other ligands (-672.34 kJ/mol compared to Enzyme-ATP complex with -792.37 kJ/mol).

Conclusion : We suggest Bemcentinib as a novel potent inhibitor of the CK1δ. Besides its high binding affinity compared to ATP (-9.1 kcal/mol), it can inhibit two out of three ATP binding sites, and it is more stable compared to Repotrectinib in MD simulation. Nevertheless, according to hex software results, Repotrectinib is still a potential candidate for CK1δ inhibition.

Keywords : Alzheimer; tauopathy; molecular dynamics; CK1δ; sleep disorder; insomnia

Count: 51
Abstract ID: 261
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Oral

Cell-free DNA as a diagnostic method in patients with neuroblastoma: A systematic review

Submission Author: Mehdi Mohebalizadeh

Mehdi Mohebalizadeh[1], Tooba Mohammadi[2], Vahid Shafiei-Irannejad[3]

1. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN
2. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN
3. Cellular and Molecular Research Center, Cellular and Molecular Medicine Institute, Urmia University of Medical Sciences, Urmia, Iran.

Background and Aim : Neuroblastoma (NB) is the most common extracranial solid tumor arising from the sympathetic nervous system. NB usually occurs in children with a median age of seventeen months and accounts for 15% of cancer-related deaths in children. Circulating cell-free DNA (cfDNA) are the nucleic acid fragments of the genome that circulate extracellularly in the bloodstream. The cfDNA can be produced by tumor cells and non-tumor cells growing around tumor tissue. The cfDNA has progressively been used as a diagnostic, prognostic, and predictive marker in cancer. This systematic review aims to summarize cfDNA levels and their detection methods for the early detection of neuroblastoma.

Methods : After determining the keywords, we searched MeSH terms and free keywords in Medline, Scopus, Web of Science, and Cochrane Library databases. As well as to find information in Farsi databases such as Iranmedex, SID, IranDoc, and Magiran also were searched. The Inclusion criteria are patient-based articles containing data about cfDNA extraction or discussion specificity, sensitivity, and accuracy. Secondary studies were excluded. Two experts extracted the data simultaneously. We measured the value of the detailed studies using the Cochrane Collaboration tool for measuring the risk of bias.

Results : A total of 318 possible studies were first searched. Following eligibility screening by title and abstract, 270 studies were eliminated. The full text was screened, and 38 studies were excluded because they were RNA-related and irrelevant. Finally, 15 studies met the inclusion criteria and were included for descriptive summarization. The qPCR method was the most used in detecting the gene segments. The most commonly seen genetic alternation was MYCN amplification. In total, 4 of 15 studies analyzed MYCN. Other mutations such as ALK,

NSE/(LINE-1), RET, RASSF1A, and APC mutations were often observed, usually in combination with MYCN mutations. Our study showed that cfDNA levels were associated with the time of onset of neuroblastoma. Some studies have shown that people with recent neuroblastoma had higher levels of cfDNA than those with long-term disease. The results indicate that high levels of cfDNA can be considered a biomarker for the recurrence of neuroblastoma. Other studies have also shown that cfDNA levels are associated with the stage of the disease in neuroblastoma. As in patients with a lower setting, its values are less than those with a higher stage (stage 4). Overall, cfDNA levels were higher in patients with stage 4 than in stage 3, and they were higher than in patients with stage

Conclusion : According to the results, it can be concluded that cfDNA amplification can be involved in neuroblastoma. It was also found that cfDNA levels in some studies were associated with disease stage, as some have shown that people with recent neuroblastoma had higher levels of cfDNA than those with long-term disease. The results showed that MYCN and NSE genes are closely related to cfDNA levels in people with neuroblastoma.

Keywords : cfDNA; Neuroblastoma; qPCR; MYCN

Count: 52
Abstract ID: 459
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Oral

Applications and challenges of CRISPR-Cas9 technology in the treatment of neurodegenerative disorders

Submission Author: Mohamad Hosein Mohamadi

Mohamad Hosein Mohamadi[1], Kiarash Saleki[2], Parsa Alijanizadeh[3], Nima Rezaei[4]

1. Student Research Committee, Sabzevar University of Medical Sciences, Sabzevar, Iran
2. 1- Student Research Committee, Babol University of Medical Sciences, Babol, Iran. 2- USERN Office, Babol University of Medical Sciences, Babol, Iran. 3- Department of e-Learning, Virtual School of Medical Education and Management, Shahid Beheshti University of Medical Sciences(SBMU), Tehran, Iran
3. Student Research Committee, Babol University of Medical Sciences, Babol, Iran. USERN Office, Babol University of Medical Sciences, Babol, Iran.
4. 1- Corresponding author: Research Center for Immunodeficiencies, Children's Medical Center, Tehran. 2- University of Medical Sciences, Tehran, Iran. 3- Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. 4- Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Background and Aim : Today, CRISPR-Case 9 is known as a gene editing technique to insert, delete, and modify the genes. This is a RNA-guided nuclease that cleaves genetic elements. CRISPR-Cas9 gene therapy can be performed in the treatment of neurological disorders, such as neurodegenerative disorders including Alzheimer's disease (AD), Parkinson's disease (PD), Huntington' disease (HD).

Methods : First we searched for related genes that are responsible in the pathology and pathogenesis of neurodegenerative including AD, PD, and HD. We examined in vitro, in vivo and clinical studies regarding the use of CRISPR system for treatment of neurodegenerative disorders.

Results : There are two type of AD, sporadic and familial AD. APP, PSEN1, PSEN2 are major responsible for familial AD (FAD), while APOE, environmental factor, and other disease such as diabetes are associated to sporadic AD (SAD). Within AD, A? protein is produced by catalytic activity of BACE1 and ?-secretase. Therefore, BACE1 can be a potential therapeutic candidate for AD. It also, decreases memory impairment. In vivo studies have accredit this therapeutic strategy. ?-secretase, another is regulated by ?-secretase activating protein (GSAP). In vitro experiment showed A? secretion reduced, after GSAP knockout by CRISPR-Cas9. Moreover, targeting APOE

gene by CRISPR-Cas9, can decrease A? and hyper-phosphorylation tau protein. Besides, Cysteinyl leukotrienes 9 (Cys-LTs) are major pro-inflammatory molecules that take part in the neuroinflammation of AD. CRISPR-mediated knockout of Cys-LT receptors (CysLT1R, CysLT2R), can decrease the inflammation, A? deposition and preserve neuroplasticity in the AD. Within PD, misfolded proteins such as ?-synuclein and Lewy bodies and deposited, thus synuclein gene (SCNA) variants are basically associated with PD. CRISPR-Cas9 technique was used to modify SCNA variants as the treatment of PD. Also, mutations in the leucine-rich repeat kinase 2 (LRRK2) are accounted as the main genetic cause of PD. Mutations of this gene can cause toxicity in the dopaminergic neurons. Among LRRK2 variants, p.G2019S mutation are more associated PD pathogenesis. In vitro studies of human IPSC and CRISPR technique showed that this gene modification can preserve dopaminergic neuron in PD. Huntington's disease is an autosomal neurodegenerative disorder caused by CAG repeat expansions in the huntingtin (HTT) gene which produces an abnormal HTT protein. CRISPR-mediated inactivation of mutant HTT can reduce production of HTT effectively. Also, TRPC1 gene (a component in the calcium signaling) is a potential candidate. After TRPC1 inhibition by CRISPR, motor performance improvement was observed in the PD. The main limitation in the use of CRISPR-Cas9 is the unwanted mutation such as insertion and deletion. They are off-target and sometimes they may lead to cellular overgrowth and eventually malignancy.

Conclusion : To date, many genes are found responsible in the underlying pathogenesis and pathology of neurodegenerative disorders. By CRISPR technology, defective (responsible for disease) genes can be modified or excluded from the human genome. Notably, further research should focus on the resolution of limitations to reach the favourable experimental and clinical outcome.

Keywords : CRISPR-Cas9, Alzheimer's disease, Parkinson's disease, Huntington's disease

Count: 53
Abstract ID: 420
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Oral

Parvalbumin interneuron loss mediates repeated anesthesia-induced memory deficits in mice

Submission Author: Mohammad Javad Eslamizade

Mohammad Javad Eslamizade[1]

1. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Siences, Tehran, Iran

Background and Aim : Repeated or prolonged, but not short-term, general anesthesia during the early postnatal period causes long-lasting impairments in memory formation in various species. The mechanisms underlying long-lasting impairment in cognitive function are poorly understood.

Methods : Here we showed that repeated general anesthesia in postnatal mice induces preferential apoptosis and subsequent loss of parvalbumin-positive inhibitory interneurons in the hippocampus.

Results : Each parvalbumin interneuron controls the activity of multiple pyramidal excitatory neurons, thereby regulating neuronal circuits and memory consolidation. Preventing the loss of parvalbumin neurons by deleting a pro-apoptotic protein MAPL (Mitochondrial Anchored Protein Ligase) selectively in parvalbumin neurons rescued anesthesia-induced deficits in pyramidal cell inhibition, and hippocampus-dependent long-term memory. Conversely, partial depletion of parvalbumin neurons in neonates was sufficient to engender long-lasting memory impairment.

Conclusion : Thus, loss of parvalbumin interneurons in postnatal mice following repeated general anesthesia critically contributes to memory deficits in adulthood.

Keywords : Apoptosis; Memory; Neuroscience

Count: 54
Abstract ID: 436
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Inhibition of amyloid-β-induced hyperactive NF-κB restores intrinsic excitability of CA1 pyramidal neurons

Submission Author: Zahra Soleimani

Zahra Soleimani[1], Mohammad J. Eslamizade[2], Mahyar Janahmadi[3]

1. Department of Physiology and Neuroscience Research Center, Shahid Beheshti Medical Sciences University, Tehran, Iran
2. 2-Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Department of Physiology and Neuroscience Research Center, Shahid Beheshti Medical Sciences University, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is the most prevalent neurodegenerative disorder worldwide. There are extensive basic and clinical evidences indicating association of aberrant neuronal activity with AD, however underpinning cellular mechanisms of this dysregulation remained ambiguous. In this study, we show evidences that hyperactive NF-κB signaling pathway, as one of the main transcription factors involved in AD pathophysiology, might be linked to aberrant gene regulation and hence, neuronal activity.

Methods : To approach this, amyloid 1-42 peptides have been injected into the deep layers of the frontal cortex in rats with a consequent upregulation in nuclear p65 immunoreactivity in hippocampal neurons. Furthermore, we show this is associated with a reduced intrinsic excitability and changes in the membrane properties of CA1 pyramidal neurons with the electrophysiology method. Specifically, electrophysiological parameters assessed were resting membrane potential, input resistance, capacitance, and also activity-dependent properties, including sag ratio, instantaneous frequency, the number of evoked spikes, and afterhyperpolarization potential.

Results : Interestingly, incubation of hippocampal slices in artificial cerebrospinal fluid containing JSH-23, that prevents phosphorylation and nuclear translocation of p65 subunits of NF-?B, does not change electrophysiological properties of neurons from control slices, however, restored normal neuronal activity in hippocampal slices from amyloid injected animals.

Conclusion : Collectively, our results suggest that hyperactive NF-κB signaling in AD is associated with abnormal neuronal activity and pharmacologic inhibition of this signaling might be a target to restore the function of hippocampal neurons in this disease.

Keywords : Alzheimer's disease; Hippocampus; NF-κB pathway; JSH-23

Count: 55
Abstract ID: 288
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Alterations of TRPM2 gene expression and EEG pattern in animal model of depression under the treatment of Niosome hesperidin

Submission Author: Mahsa Otarkhaniy

Mahsa Otarkhaniy[1], Homeira Hatami[2], Yousef panahi[3], Abdallah Al Jammal[4]

1. Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. Department of Basic Sciences, Faculty of Veterinary Medicine, University of Tabriz, Tabriz, Iran
4. Ph.D. Student in Animal physiology, Department of Animal Sciences and Biotechnology, Faculty of life Sciences and Biotechnology, Shahid Beheshti University, Tehran,Iran

Background and Aim : Depression disorder is a common, devastating illness. The TRPM2 or Transient receptor potential cation channel is a subfamily of TRP (Transient receptor potential channels) and can cause changes in oxidative stress parameters and be effective in causing depression. Also, depression can affect Electroencephalography or EEG. Hesperidin is a natural antioxidant and Niosome hesperidin is a form of Nano drug delivery. This study aims to investigate the effects of hesperidin and Niosome hesperidin on TRPM2 gene expression changes in the hippocampal area and EEG pattern alterations in the cortex of depressed rats.

Methods : In this study, we used 36 adult male rats. The animals were divided into six groups. The control group received saline for 14 days. The depressed group received reserpine (0.5 mg/kg) for 14 days to induce depression. The treatment group with hesperidin first received reserpine for 14 days to induce depression and then received the antioxidant hesperidin (20 mg/kg) for 14 days. The hesperidin group received hesperidin (20 mg/kg) for 14 days. The niosome hesperidin group received niosome hesperidin (20 mg/kg) for 7 days. The treatment group with niosome first received reserpine for 14 days to induce depression and then received niosome hesperidin (20 mg/kg) for 7 days. For the EEG test, the animals were anesthetized with ketamine and xylazine (5ml/kg) 24 hours before sacrifice, and the electrodes were placed in the cerebral cortex and legs of the rats, and the brain waves were recorded and analyzed with MATLAB software. After the last test, the animals were anesthetized with ketamine and xylazine (dose?) and the hippocampal area of the rats' brains was removed, and the changes in the expression of the trpm2 gene were examined by Real-Time PCR. Data were analyzed by one-way ANOVA followed by Tukey test. $p < 0.05$ was considered statistically significant.

Results : The results show that there was a significant difference between the groups in signals of EEG. The frequency of alpha waves in the treatment group with nisome hesperidin decreased significantly compared to the hesperidin group ($p<0.001$). Also, the hesperidin increased significantly compared to the depression group ($p<0.001$). The frequency of beta waves in the depression group decreased significantly compared to the control group ($p<0.01$). Also, in the treatment group with niosome hesperidin decreased significantly compared to the hesperidin group ($p<0.001$). The frequency of delta waves in the depression group increased significantly compared to the control group ($p<0.001$). Also, in the treatment group with niosome hesperidin decreased significantly compared to the depression group ($p<0.001$). The frequency of theta waves in the treatment group with nisome hesperidin decreased significantly compared to the hesperidin group ($p<0.001$). The frequency of gamma waves in the treatment group with nisome hesperidin decreased significantly compared to the control group ($p<0.05$) and also the treatment group with hesperidin decreased significantly compared to the hesperidin group ($p<0.05$). The trpm2 gene was significantly increased in the depressed group compared to the control ($p<0.001$).

Conclusion : Transient receptor potential (TRP) channels are transmembrane protein complexes that play important roles in the physiology and pathophysiology of both the central nervous system (CNS) and the peripheral nerve system (PNS). These channels have been implicated in neurological disorders like depression. Also it seems that Nisome Hesperidin as a nanoparticle can affect the expression level of the trpm2 gene. The frequency pattern of EEG waves changed during depression and treatment with the Nisome Hesperidin especially improved the mentioned design.

Keywords : Depression, Nano particle, EEG, TRPM2, Cortex and Hippocampus

Count: 56
Abstract ID: 103
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Whole blood Transcriptome analysis in autoimmune patients

Submission Author: Fatemeh EmamiPari

Amir Sabbaghian[1], Navid Kashani[2], Fatemeh EmamiPari[3], Mostafa Khedrinia[4]

1. Student Research Committee, Department of Molecular Medicine, School of Advanced Technologies in Medicine, Golestan University of Medical Sciences, Gorgan, Iran.
2. Master Of Cell and Molecular, Department of Biology, Faculty of Basic Sciences, Islamic Azad University, Gorgan branch, Gorgan, Iran
3. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
4. Master of General Biochemistry, Department of Biology, Faculty of Science, Golestan University, Gorgan, Iran

Background and Aim : Multiple Sclerosis (MS), Amyotrophic Lateral Sclerosis (ALS), and Sepsis are three autoimmune diseases with a high incidence and high rate of disability. Autoimmune diseases result from a disorder in the immune system caused by complex environmental and genetic factors and interactions. Different gene expression in patients compared to the control group has been shown in several studies. These factors affect the severity, type of disease, and how it responds to treatment. Therefore, the present study was conducted to investigate new biomarkers that may have use in therapeutic or prognostic agents.

Methods : The RNA-sequencing dataset, PRJNA258216 (Accession: GSE60424, ID: 200060424), was retrieved from the Gene Expression Omnibus (GEO). The datasets included a total of 134 blood samples, of which 21 were ALS, 28 were healthy controls, 20 were sepsis, 19 were MS without any treatment, 28 were MS post-treatment, and 26 patients had type 1 diabetes. MS post-treatment and type 1 diabetes were discarded due to the low quality of their reads and because of being treated with other factors. For the preprocessing step, FASTQC was used to control the quality of reads. Also, TRIMGALORE was used to trim the low-quality reads. HISAT2 was applied to align the reads with the human reference genome HG38. Deseq2 was performed to discover differential gene expression between healthy and patients dataset. Gene ontology (GO) and Kyoto Encyclopedia of Gene and Genome (KEGG) enriched pathways were also performed for annotation and visualisation with DEGs.

Results : A total of 11 DEGs (with downregulated) were identified, including ATP11A, UTRN, Siglec1, XAF1, IFI44L, MX1, HERC5, SREK1, KDM7A, CELF2.AS1 and TAIL1, which were abnormally expressed in the GEO datasets. GO analysis in cellular component terms indicated that

DEGs were mainly enriched in interferon signalling. Moreover, in biological processes where type I interferon signalling and cellular response to type 1 interferon were conferred. Also, in molecular function, DEGs were especially active in the filopodium membrane). KEGG pathway enrichment analyses demonstrated that DEGs were mainly enriched in histone demethylase activity and Phosphatidylserine flippase activity.

Conclusion : The multiple molecular mechanisms of these new vital genes in MS, ALS, and Sepsis need further investigation and may apply as prediction or diagnosis factors for treating these diseases.

Keywords : Multiple Sclerosis; Amyotrophic Lateral Sclerosis; Sepsis; RNA-Sequencing; biomarker, differentially expressed genes; bioinformatical analysis

Count: 57
Abstract ID: 140
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

The effect of zinc zeolite on learning and spatial memory of Alzheimer's rat

Submission Author: Maryam Zaman Fashami

Maryam Zaman Fashami[1], Dr Batool Ghorbani Yekta[2], Dr Hamid Reza Shakouri[3], Dr Fatemeh Khakpai[4]

1. author
2. Assistant Professor
3. Professor
4. Assistant Professor

Background and Aim : Alzheimer's disease is a destructive and progressive brain disease that is associated with dementia and causes the destruction of brain cells, especially in the hippocampusConsidering the aging process of the population in Iran, finding a way to slow down the process of AD or definitive treatment for this disease is of particular importance. In the early stages of Alzheimer's disease, neuron-fibrous tangles first appear in the hippocampus, and also beta-amyloid accumulation causes tau protein phosphorylation and the shape of neurofibrous tangles. Finally, cell dysfunction and cell death caused by beta-amyloid occurs in Alzheimer's disease. In recent years, the hypothesis of metal imbalance has been proposed, which indicates that the interaction between zinc in the brain and proteins related to Alzheimer's (tau protein and amyloid precursor) can trigger the onset of Alzheimer's. An imbalance of metal ions causes the protein to come out of its folded state and this causes the formation of beta peptide amyloids. Studies show that the reduction of zinc inside the cells causes more expression of the apolipoprotein E gene and the possibility of Alzheimer's disease. Zeolites are porous minerals that are made of aluminum and silicates and have the ability to exchange ions, and the active substance is trapped in the pores of the zeolite and creates hydrogen bonds so that it can be targeted in the tissue and be easily removed. The purpose of this research is to investigate the effect of zinc zeolite in the brain of experimental Alzheimer's model rats.

Methods : Male Wistar rats were used in this experiment and they were divided into 4 groups. Zinc zeolite was injected into a group of Alzheimer's rats under standard protocols, and after the test, the results were recorded and analyzed.

Results : After examining the test data and tests, it was observed that zinc zeolite reduces the level of tau proteins in Alzheimer's mice and reduces the AD process.

Conclusion : The reducing effect of zinc zeolite on the amount of tau proteins in Alzheimer's mice can be considered a turning point in finding a solution to prevent AD.

Keywords : Alzheimer, Zinc Zeolite, Protein TAU

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 58
Abstract ID: 139
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Selegiline ameliorates passive avoidance memory impairment in a rat model of Alzheimer's disease: The role of hippocampal synaptic plasticity and oxidative stress

Submission Author: Hamid Shokati Basir

Hamid Shokati Basir[1], Naser Mirazi[2], Alireza Komaki[3]

1. Department of Biology, Faculty of Basic Sciences, Bu-Ali Sina University, Hamedan, Iran
2. Department of Biology, Faculty of Basic Sciences, Bu-Ali Sina University, Hamedan, Iran
3. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Alzheimer's disease (AD), one of the leading causes of dementia, is characterized by progressive loss of cognitive performance and synaptic plasticity. The present study was designed to examine the putative effects of selegiline (5 mg/kg, orally, once daily for 30 days starting from day 7 after to amyloid-beta (Aβ) injection) on passive avoidance memory function and to identify the roles of hippocampal synaptic plasticity and oxidative stress in an AD rat model induced by intracerebroventricular (ICV) injection of Aβ.

Methods : At the end of the experiment, passive avoidance learning and memory were assessed by shuttle box. Subsequently, hippocampal long-term potentiation (LTP) in perforant path-dentate gyrus (PP-DG) synapses was conducted for evaluation of population spike (PS) amplitude and field excitatory postsynaptic potentials (fEPSPs) slope. Total thiol group (TTG) and malondialdehyde (MDA) concentrations were evaluated in the serum. Further, compact Aβ plaques were detected in the hippocampal DG by Congo red staining.

Results : The results showed that A?injection leads to passive avoidance memory impairment, which was paralleled by a reduction in fEPSPs slope, PS amplitude, and TTG content, and increase in MDA level and A? plaques formation in the rats. In contrast, selegiline treatment ameliorated passive avoidance memory dysfunction, improved hippocampal LTP impairment, modulated oxidative-antioxidative status, and hindered A? plaques production in the A?-infused 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 formation.

Keywords : Alzheimer's disease; Selegiline; Passive avoidance memory; Long-term potentiation; Oxidative stress.

Count: 59
Abstract ID: 207
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

p-Coumaric acid ameliorates cognitive and non-cognitive disturbances in a rat model of Alzheimer's disease: The role of oxidative stress and inflammation

Submission Author: Shahab Ghaderi

Shahab Ghaderi[1], Parsa Gholipour[2], Alireza Komaki[3], Iraj Salehi[4], Khodabakhsh Rashidi[5], Seyed Esmaeil Khoshnam[6], Masome Rashno[7]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
2. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
3. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
4. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
5. Research Center of Oils and Fats, Kermanshah University of Medical Sciences, Kermanshah, Iran
6. Persian Gulf Physiology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
7. Asadabad School of Medical Sciences, Asadabad, Iran

Background and Aim : Alzheimer's disease (AD) is the most progressive form of neurodegenerative disease resulting in cognitive and non-cognitive deficits. Aluminum is recognized as a risk factor for the etiology, pathogenesis, and progression of AD. The present study was designed to determine the effects of p-coumaric acid (p-CA), a phenolic compound, on spatial cognitive ability and non-cognitive functions and to identify the role of oxidative stress and inflammation in an AD rat model induced by aluminum chloride (AlCl3).

Methods : Both AlCl3 (100 mg/kg/day; P.O.) and p-CA (100 mg/kg/day; P.O.) treatments were given for six consecutive weeks. During the fifth and sixth weeks of the treatment period, the cognitive and non-cognitive functions of the rats were assessed using standard behavioral tests. Additionally, oxidative-antioxidative status, inflammatory markers, and histological changes were evaluated in the cerebral cortex and hippocampal regions of the rats.

Results : The results of this study showed that AlCl3 exposure enhanced anxiety-/depression-like behaviors, reduced locomotor/exploratory activities, and impaired spatial learning and memory. These cognitive and non-cognitive disturbances were accompanied by increasing oxidative stress, enhancing inflammatory response, and neuronal loss in the studied brain regions. Interestingly,

treatment with p-CA alleviated all the above-mentioned neuropathological changes in the AlCl3-induced AD rat model.

Conclusion : The findings suggest that both anti-oxidative and anti-inflammatory properties of p-CA may be the underlying mechanisms behind its beneficial effect in preventing neuronal loss and improving cognitive and non-cognitive deficits associated with AD.

Keywords : Alzheimer's disease Aluminum chloride p-Coumaric acid Non-cognitive disturbances Oxidative stress Inflammation

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 60
Abstract ID: 172
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Expression and clinical significance of IL7R in familial and sporadic multiple sclerosis

Submission Author: Seyede zahra Hosseini imani

Seyede zahra Hosseini imani[1]

1. Presenting Author

Background and Aim : Multiple sclerosis (MS) is a chronic inflammatory and autoimmune disorder of the central nervous system characterized by myelin loss and axonal dysfunction. Increased production of inflammatory factors such as cytokines has been implicated in axon destruction

Methods : In the present study, we compared the expression level of IL7R gene in the peripheral blood of 72 MS patients (37 familial MS, 35 sporadic MS) and 74 healthy controls (34 individuals with a family history of the disease, 40 healthy controls without a family history) via Real-time PCR. Diagnostic evaluation was performed by ROC (Receiver operating characteristic) curve analysis and area under the curve (AUC) calculation. The correlation of clinical parameters including onset age and EDSS (Expanded Disability Status Scale) with our gene expression level was also assessed.

Results : Our results demonstrated a significant down-regulation of IL7R in sporadic MS patients compared with the control group (Pvalue < 0.0001, Fold change (FC)=-80%) as well as the FDR group (Pvalue=0.0005, FC=-71%). There was also a significant decrease in the expression of sporadic versus familial patients (Pvalue=0.0004, FC=-70%). In another of classification (among MS patients and healthy controls), the expression level of IL7R was lower in MS patients as compared to the control group (Pvalue= 0.0009, FC=-57%).According to the expression level of IL7R between all patients and healthy controls, AUC was 0.66 (Pvalue= 0.0014). Plotting ROC curve for the sporadic patients versus FDR group (AUC=0.75, Pvalue=0.0007), also sporadic patients versus healthy controls (AUC=0.79, Pvalue < 0.0001), and sporadic patients versus familial patients (AUC=0.71, Pvalue=0.003).The correlation of clinical parameters including onset age and EDSS (Expanded Disability Status Scale) with our gene expression level was also assessed. The results did not show any significant correlation.

Conclusion : Overall, according to the results of our study, the down regulation of IL7R can be considered as a biomarker for sporadic but not familial MS patients.

Keywords : Multiple sclerosis, Real-Time PCR, Therapeutics, Cytokine, Interleukin

Count: 61
Abstract ID: 447
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Inactivation of hippocampal dentate gyrus NMDA receptors improved memory impairment in streptozotocin-induced animal model of sporadic Alzheimer's disease

Submission Author: Negar Ahmadian

Negar Ahmadian[1], Zahra Dehghani[2], Ladan Delphi[3], Elaheh Asadollahi[4], Behnaz Bakhshandeh[5], Ameneh Rezayof[6]

1. Department of cellular and molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
2. Department of Biotechnology, University of Tehran, Tehran, Iran
3. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
4. Department of molecular genetics, Tarbiat modares university , Tehran, Iran
5. Department of Biotechnology, University of Tehran, Tehran, Iran
6. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran, arezayof@ut.ac.ir

Background and Aim : Alzheimer's disease (AD), a neurodegenerative disorder, is associated with progressive cognitive dysfunction. Evidence suggests that animal models of Alzheimer's disease (AD) are critically employed to understand the disease pathogenesis better to evaluate the potential of novel therapeutic approaches. Intracerebroventricular-streptozotocin (ICV-STZ)-induced AD rat model has widely been used to study AD-related mechanisms in various aspects of AD. Since there is a functional interaction between STZ signaling pathways and glutamatergic NMDA receptors mechanism, the present study aimed to investigate the possible role of hippocampal dentate gyrus (DG) NMDA receptors in ICV-STZ-induced memory impairment.

Methods : Male Wistar rats (200-230 gr) were simultaneously cannulated unilaterally in the lateral ventricle and the DG with a stereotaxic apparatus. A step-through passive avoidance task was used to assess memory formation. The animals received ICV-STZ on days 1 and 3 after surgery. During the STZ effect on the brain, the animals received intra-DG D-AP5, an NMDA receptor antagonist, every other day to inactivate the DG NMDA receptors. After 14 days, the training and testing phases were performed to measure memory retrieval in the control and experimental groups.

Results : ICV microinjection of STZ impaired memory formation, suggesting an amnesic effect of the drug in passive avoidance learning. Five times intra-DG microinjection of D-AP5 improved

ICV-STZ-induced memory impairment. It should be considered that the microinjection of D-AP5 into the hippocampal DG alone impaired memory formation in the same dose and manner.

Conclusion : These findings show that ICV-STZ impaired passive avoidance memory retrieval, suggesting an animal model of AD in rats. Moreover, the hippocampal DG glutamatergic system mediates the effects of STZ in the passive avoidance learning. Considering that the DG inactivation of NMDA receptors improved STZ-induced memory impairment, pharmacological targeting of NMDA receptors through the administration of NMDA receptor antagonists may be a therapeutic strategy for AD treatment.

Keywords : Streptozotocin; D-AP5; Memory impairment; Rat(s)

Count: 62
Abstract ID: 189
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Hippocampal Astrocyte Response to Melatonin Following Neural Damage Induction in Rats

Submission Author: Mohsen Basiri

Mohsen Basiri[1], Abdolreza Babaee[2], Seyed Hassan Eftekhar Vaghefi[3], Samereh Dehghani Soltani[4], Nader Shahrokhi[5], Majid Asadi Shekaari[6]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
2. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran.
3. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran.
4. Department of Anatomy, School of Medicine, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
5. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
6. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.

Background and Aim : Brain injury induces an almost immediate response from glial cells, especially astrocytes. Activation of astrocytes leads to the production of inflammatory cytokines and reactive oxygen species that may result in secondary neuronal damage. Melatonin is an anti-inflammatory and antioxidant agent, and it has been reported to exert neuroprotection through the prevention of neuronal death in several models of central nervous system injury. This study aimed to investigate the effect of melatonin on astrocyte activation induced by Traumatic Brain Injury (TBI) in rat hippocampus and dentate gyrus.

Methods : Animals were randomly divided into 5 groups; Sham group, TBI group, vehicle group, and melatonin-treated TBI groups (TBI+Mel5, TBI+Mel20). Immunohistochemical method (GFAP marker) and TUNEL assay were used to evaluate astrocyte reactivity and neuronal death, respectively.

Results : The results demonstrated that the astrocyte number was reduced significantly in melatonin-treated groups compared to the vehicle group. Additionally, based on TUNEL results, melatonin administration noticeably reduced the number of apoptotic neurons in the rat hippocampus and dentate gyrus.

Conclusion : In general, our findings suggest that melatonin treatment after brain injury reduces astrocyte reactivity as well as neuronal cell apoptosis in rat hippocampus and dentate gyrus.

Keywords : Melatonin, Astrocyte, GFAP, Hippocampus

11th Basic and Clinical Neuroscience Congress 2022
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Count: 63
Abstract ID: 56
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

The effects of Minocycline on the neurological and inflammatory factors expression after severe traumatic brain injury in male rats: A molecular and histological stud

Submission Author: ALi Siahposht khachaki

ALi Siahposht khachaki[1], ALi Siahposht - khachaki[2], mohammad rahnama[3], mozhgan abbasi[4]

1. -
2. * Associate Professor, imunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Medical Student, Mazandaran University of Medical Science, Sari, Iran
4. Assistant Professor of Medical Biotechnology Department of Applied Cellular Sciences, School of Advanced Technologies in Medicine Immunogenetic Research Center

Background and Aim : Traumatic brain injury (TBI) is a very complex disorder that includes different degrees of brain contusion, diffuse axonal damage, hemorrhage, and hypoxia. Minocycline is an antibiotic that acts through anti-inflammatory activities and has neuroprotective effects in the central nervous system. Therefore, in this research project, we investigated the role of neuron protection of minocycline 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, Wistar rats were subjected to diffuse controlled concussion using the snake method, and 30 minutes later, the drug was injected intraperitoneally with different doses. It was repeated in the following days. After 72 hours, the brain tissue was collected from the Cisterna Magna and was designed to examine the expression changes of IL-1β, IL-10, Bcl-2 and BAX genes, and using the Real-Time PCR method, the expression changes of the mentioned genes in Brain samples of different groups were evaluated. And the rats were killed under deep anesthesia and their brains were removed and fixed in 10% formalin for 48 hours and used for staining with hematoxylin and eosin.

Results : The findings of this study show that brain injury caused by controlled diffuse trauma causes brain tissue edema and changes in the animal's neurological and balance scores. It also leads to an increase in the expression of interleukin 1 beta and a decrease in interleukin 10 in the brain tissue. Also, our findings showed that minocycline in doses of 22.5 mg/kg and 45 mg/kg can reduce

these differences compared to the control group (p<0.001)). It should be noted that minocycline was more effective at a dose of 22.5 mg/kg (P<0.0001

Conclusion : Based on this study, it can be seen that, firstly, minocycline has neuron protection 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 grades. Be neurological and balanced. Secondly, these effects of minocycline are through the reduction of inflammatory interleukins and the increase of anti-inflammatory interleukins and the effect on their genes.

Keywords : minocycline, neuroprotective, brain trauma, brain edema, blood-brain barrier, interleukins

Count: 64
Abstract ID: 52
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Carnosic Acids neuroprotective effect on neurological score, blood–brain barrier & Evaluation of motor function after severe traumatic brain injury in male rat: behavioral, biochemical & histological

Submission Author: Melika Silakhor

Melika Silakhor[1], Ali Eghbali [2], Nastaran Yoonesi[3], Ali Siahposht-Khachaki[4]

1. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
2. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
3. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
4. Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Nowadays brain trauma is one of the considerable reasons for hospitalization and death among young people. Many labiate herbs such as Rosmarinus Officinalis (rosemary) and saliva official (Sage) contain Carnosic acid (CA)which is known to be a phenolic diterpene. Extractions of these plants unleash anti-oxidative and anti-inflammatory chemicals, but the underlying mechanisms have been only reported recently. Therefore, in this study, we investigated the neuroprotective effects of CA after induction of brain injury in rats and interrogate its mechanism.

Methods : Thirty minutes after traumatic brain injury induction by Marmarou free fall method, CA three different doses (3, 6, and 12 mg/kg) were administered intraperitoneally. VCS of animals were recorded during a period (pre), after (D0), 24 hours later (D1), 48 hours (D2), and 72 hours (D3) after TBI induction. Vestibulomotor tests were evaluated by Beam Walk (BW) and Beam Balance (BB) tests in a similar fashion. To determine the permeability of Blood-Brain Barrier (BBB) and brain edema 72 hours after TBI induction, Evans-Blue dye and Wet-Dry methods were employed respectively. Cerebrospinal fluid (CSF) was collected 72 hours after TBI induction to evaluate the levels of IL-1β and IL-10.

Results : Our findings showed that traumatic brain injury causes cerebral edema and destruction of the blood-brain barrier, changes in the neurological and equilibrium scores of the animal, and a significant increase in IL-1β and a decrease in IL-10 (P <0.001). 6 and 12 mg/kg CA was able to eliminate these disorders compared to the control group, but at a dose of 12 mg, these changes

were more pronounced ($P < 0.0001$). Carnosic acid at doses of 6 and 12 mg/kg decreased IL-1β after 72 hours, but 3 mg/kg did not have a significant effect on behavioral and biochemical values.

Conclusion : As a result of our studies, it appears that CA after induction of severe brain trauma at doses of 6 and 12 mg/kg has beneficial effects on severe traumatic brain injury by altering interleukins cerebrospinal fluid and improving the blood-brain barrier. This effect was more remarkable at a dose of 12 mg/kg. Therefore, it has a dose-dependent neuroprotective effect on brain trauma, which demands more molecular and biochemical work to understand the mechanism of effects.

Keywords : Carnosic acid, Traumatic brain injury, Neuroprotection, interleukins, Rat

Count: 65
Abstract ID: 27
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

The neuroprotective effects of hypericum perforatum on neurological scores, BBB permeability & brain edema after severe traumatic brain injury in male rat: A behavioral,biochemical & histological study

Submission Author: Vahid Alivirdiloo

Vahid Alivirdiloo [1], *Ali Siahposht-Khachaki[2], Alireza Shamohammadi[3]

1. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
2. * Correspondence should be sent to: Ali Siahposht- Khachaki, PhD Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran P.O.Box: 48471- 91971, sari, Iran; Tel & Fax: +98-11-33543081 Fax: +98-11-33543249 Email: a.siahposht@mazums.ac.ir
3. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Motorcycle accidents account for a significant part of the trauma, which is about 49.1%, so on average, in Iran, about 21,000 deaths occur annually due to brain trauma caused by accidents. Hypericum perforatum It is herbaceous and has a short rhizome that grows to a height of one meter. (HYP) Hypericum perforatum is a neuroprotective agent that prevents neurodegenerative diseases through antioxidant, anti-inflammatory effects and regulation of neurotransmitter release, so in this research plan we investigated the neuroprotective role of hypericum perforatum in the process of diffuse concussion in rats, as well as its effect on the level of interleukins and histological changes.

Methods : 60 Wistar rats were subjected to diffuse controlled concussion using the marmaru method, and 30 minutes later, hypericum perforatum was injected intraperitoneally with different doses. Pre-TBI, immediately after TBI, 24, 48 and 72 hours after the TBI, the VCS and the movement and balance tests of Beam Walk and Beam Balance were taken and recorded from the rats. After 72 hours, CSF was collected from the cisterna magna and used to perform an ELISA test to check the level of interleukins. The 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. The permeability of the blood-brain barrier was tested by the injection of Evans dye after induction of concussion in the rats of the respective groups.

Results : The findings of this study show that brain injury caused by controlled diffuse trauma causes cerebral edema, destruction of the blood-brain barrier, disturbance in the animal's

neurological and balance-motor scores (P<0.0001). It also leads to an increase of interleukin 1 beta and a decrease of interleukin 10 in CSF fluid (P<0.0001). Also, our findings showed that hypericum perforatum (HYP) in doses of 30 mg/kg and 60 mg/kg can reduce these differences compared to the control group (Sham and Intact) (p<0.001)). It should be noted that hypericum perforatum was more effective at a dose of 60 mg/kg (P<0.0001).

Conclusion : Based on this study, it can be seen that, firstly, hypericum perforatum has dose-dependent neuroprotective 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 grades. Be neurological and balanced. Also, histological changes have been achieved in the direction of recovery. Secondly, these effects of hypericum perforatum are probably through the reduction of inflammatory interleukins and the increase of anti-inflammatory interleukins.

Keywords : Traumatic brain injury , Hypericum Perforatum, Brain Trauma, Blood Brain Barrier, Rat, neuroprotective agents

Count: 66
Abstract ID: 5
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Tramadol exposure upregulated apoptosis, inflammation and autophagy in PC12 cells and rat's striatum: An in vitro- in vivo approach

Submission Author: Reza Soltani

Reza Soltani[1]

1. Cell Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Tramadol is a synthetic analogue of codeine, mostly prescribed for the alleviation of mild to moderate pains. It bears several side effects including emotional instability and anxiety. In this study, we focused on the alteration in expression of autophagic and apoptotic genes in PC-12 cells for our in vitro and structural and functional changes of striatum for our in vivo under chronic exposure of tramadol.

Methods : For in vitro side of the study, PC12 cells were exposed to tramadol (50 μM) and expression of apoptosis and autophagy genes were determined. In parallel, rats were daily treated with tramadol at doses of 50 mg/kg for three weeks for the in vivo side. Motor coordination, EMG, histopathology and gene expression were done.

Results : Our in vitro findings revealed that tramadol increased expression of apoptosis and autophagy genes in PC12 cells. Moreover, our in vivo results disclosed that tramadol not only provoked atrophy of rats' striatum, but also triggered microgliosis along with neuronal death in the striatum. Tramadol also reduced motor coordination and muscular activity.

Conclusion : Our in vitro findings revealed that tramadol increased expression of apoptosis and autophagy genes in PC12 cells. Moreover, our in vivo results disclosed that tramadol not only provoked atrophy of rats' striatum, but also triggered microgliosis along with neuronal death in the striatum. Tramadol also reduced motor coordination and muscular activity.

Keywords : Tramadol Neuroinflammatory Striatum Neurodegeneration

Count: 67
Abstract ID: 45
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Effect of amyloid β administration on hippocampal melatonin level

Submission Author: Shima Mohammadi

Shima Mohammadi[1], Maryam Zahmatkesh[2]

1. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Melatonin, a multi-tasking molecule is found in the extra-pineal tissues including the hippocampus. There are reports of melatonin reduction in Alzheimer's disease patients. However, the hippocampus melatonin following the neurotoxicity of Aβ injection has not been examined. In this work, we investigated the acute Aβ effects on hippocampus melatonin levels.

Methods : Adult male rats experienced bilateral intra-CA1 Aβ administration. The hippocampal tissue was collected 24 hours following Aβ injection, both at the morning and night. Melatonin concentrations were determined using high-performance liquid chromatography (HPLC). Melatonin levels in the hippocampal tissue were also measured in the pinealectomy condition (PIN×). Tumor necrosis factor-alpha (TNF-α) immunohistochemistry in normal and PIN× conditions were used to monitor the inflammation.

Results : The A? increased the area of TNF-? positive staining 24 hours after injection which indicated the induction of inflammation. It was accompanying with a significant reduction in hippocampal melatonin. The PIN× was a significant decrease in hippocampal melatonin in the PIN×+A? group.

Conclusion : The findings showed that Aβ decreased the melatonin level. These alterations might be attributed to inflammation and the activation of associated pathways. The hippocampal melatonin level was unaffected by the pineal gland removal.

Keywords : Alzheimer Disease; Hippocampus; Melatonin; Pinealectomy

Count: 68
Abstract ID: 273
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

In vitro and in vivo neuroprotective effects of Senna (Cassia angustifulia): implications in Parkinson 's diseases

Submission Author: Parvaneh RahimiMoghaddam

Parvaneh RahimiMoghaddam[1], Ashraf Sadat Moazzam[2]

1. Department of Pharmacology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Pharmacology and Toxicology, School of Pharmacy, Guilan University of Medical Sciences, Rasht, Iran

Background and Aim : Parkinson's disease (PD) is a neurodegenarative disorder characterized by the appearance of intracytoplasmic inclusions called Lewy bodies in dopaminergic neurons in the substansia nigra. The aim of the present study is to explore the cytoprotective effects of aqueous methanol extract of Senna leaves, against 1-methyl-4- phenylpyridium ion (MPP+) and 6-hydroxydopamine in PC12 cells, a rat cell line derived from pheochromocytoma cells. We also examined whether Senna can prevent or slowdown neuronal injury in a 6-hydroxydopamine (6-OHDA) model of Parkinson in rats.

Methods : For experiment with neurotoxins 6-OHDA and MPP+, PC12 cells (0.68×104 cells /well) were plated at a 96– well microtiter plates for 24 h before treatment. The Different concentrations of the extracts were added to the cells after 3 h before insults with 6-hydroxydopamine (500 µM). Cell viability was measured by MTT assay and expressed as a percentage of cells untreated with 6-OHDA or MPP+, which served as the control group and was designated as 100%. The in vivo experiment was carried out to evaluate the effect of Senna (25, 50,100 mg/kg/oral) pretreatment for 7 days on circling behavior. The rats were divided into eight groups, each having eight animals. Group 1: Vehicle –treated Sham-operated control group(S), group 2: senna 25mg/kg/b.w. treated sham-operated group, group 3: Senna 50 mg/kg/b.w. treated sham-operated group, group 4: senna 100 mg/kg/b.w. treated sham-operated group, group5: Vehicle-treated lesioned group, group 6: Senna 25mg/kg/b.w. treated lesioned group, group 7: Senna 50mg/kg/b.w. treated lesioned group, group8 : Senna 100mg/kg/b.w. treated lesioned group. On the 8th day, 2 µL vehicle (0.2 % ascorbic acid in normal saline) were infused in the striatum of groups 1-4 and 12.5 µg 6-OHDA in 2 µL vehicular solution to groups 5-8. The behavioral test was started after 3 weeks of lesioning.

Results : It was shown that MPP+ reduced PC12 cells and induced PC12 cells apoptosis. Importantly, we demonstrated that Senna can protect PC12 cells against MPP+ induced cytotoxicity and apoptosis. These results were confirmed by the other neurotoxin such as 6-OHDA. The in vivo experiment presented in a hemiparkinsonian rat model demonstrates the ability of Senna to partially protect degeneration of the nigrostriatal dopaminergic neurons against 6-OHDA –induced Parkinsonism. A marked decrease in rotation of lesioned groups treated with Senna might be due to a protective effect of Senna on dopaminergic neurons against 6-OHDA toxicity. It is highly significant that, in the present study, pre-treatment with Senna protected against 6-OHDA –induced parkinsonism and allowed neurons to function closer to their initial activity. Histopathology results show that the lesion group had significant degeneration of neurons, whereas the Senna-treated groups had neuroprotection. The behavioral and histopathology results in this study suggest a neuroprotective role of Senna in a 6-OHDA model of rat PD.

Conclusion : This study can be used as a potential tool to explore the neuroprotective pathways leading to the development of a potential therapeutic remedy in preventing or impeding this devastating neurologic disorder.

Keywords : 6-hidroxydopamine; neuroprotection; parkinson's disease; Senna

Count: 69
Abstract ID: 358
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Aging and inflammatory changes in rat cerebellum and anti-inflammatory effects of running exercise and rosemary leaf

Submission Author: Shima Ababzadeh

Shima Ababzadeh[1], Reihaneh Seyedebrahimi[2], Mohsen Eslami Farsani[3], Hassan Vahdat[4]

1. Cellular & Molecular Research Center, Qom University of Medical Sciences, Qom, Iran
2. Department of Anatomy, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran.
3. Department of Anatomy, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran.
4. Department of Physical Education & Sport Sciences, Faculty of Physical Education, University of Tehran, Tehran, Iran

Background and Aim : The decline in the number of births in recent years in Iran and the aging of the population in the coming decades has increased the need for research into the causes and prevention of aging. Some of the cases that seem to delay the aging process are the consumption of some traditional herbs and regular exercise. Therefore, the present study was designed to investigate the effect of aerobic training and consumption of rosemary extract on TNF-α and IL6 levels in the cerebellar tissue of old male rats.

Methods : 40 male of 18 months Wistar rats were selected with an average weighing 350-450 g and randomly divided into five groups, control, sham (treadmill off and distilled water gavage), training (12 weeks, 5 days a week), supplement or extract (12 weeks of daily 100 mg/ kg gavage rosemary extract), extract and practice at the same time, were divided. To evaluate the level of cytokines, 24 hours after the last training session, the rats anesthetized and sacrificed according to ethics. The cerebellum quickly exited the skull and froze at -80C°. Then on the day of cytokines assay, First tissues were to defrost the and after homogenization, by ELISA evaluated the levels of TNF-α and IL6.

Results : Data showed that decreased by %15 to %23 in the TNF-α protein in the treated groups compared to the sham and control, however, this decrease was not significant. In addition, results showed a significant increase for IL6 in the exercise and extracts group compared to the sham and control groups ($P < 0.05$). Also was observed a significant increase in extract and practice at the same time compared to control ($P < 0.01$), and sham ($P < 0.001$).

Conclusion : According to the study, it seems that aerobic exercise and consumption of rosemary extract to reduce inflammation and increase of anti-inflammatory factors in the elderly can be effective, however combining these two better results.

Keywords : Aging, running exercise, Rosemary, TNF-α, IL6

Count: 70
Abstract ID: 254
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

The demographic features and risk factors of patients who experienced Cerebrovascular accidents hospitalized in the neurology ward in Urmia

Submission Author: Tooba Mohammadi

Tooba Mohammadi[1], Sima lalshahsavar[2], Sourena nazarbaghi[3]

1. students research committee, Urmia University of medical science, Urmia, Iran
2. students research committee, Urmia University of medical science, Urmia, Iran
3. assisstant professor, neurology department of Urmia Medical sciences

Background and Aim : Background: Cerebrovascular accident (CVA) or stroke is the most common neurological disorder that leads to death or disability in adults. Despite a significant reduction in stroke deaths in the last two decades, it is still a significant cause of hospitalization and long-term disability. Stroke results from a disruption in blood supply to an area of the brain due to stricture or rupture of an artery called ischemic and hemorrhagic stroke. The symptoms include hemiparesis, hemiplegia, ataxia, impaired speech, dysphagia, paresthesia, diplopia, blurred vision or loss of vision, impaired cognition, and dizziness. Considering the high importance and death rate of strokes, we investigated the affected people's conditions to get insights into improving the condition.

Methods : Methods: After approval of the ethics committee, the data, consisting of demographic and probable risk factors, were extracted and analyzed from the archive. The Inclusion criteria were age over 18 and confirmed cervical stenosis-induced stroke diagnosis. Those who experienced a transient ischemic attack (TIA) or had any past medical history of vasculitis were excluded.

Results : Results: In this study, 186 patients included 134 (72%) patients diagnosed with CVA and 52 (28%) with TIA. 46.8% of patients were female, and 53.2% were male. The average age was 65.96 ± 15.30 years. The CVA patients were significantly older than TIA patients (P=0.01). The most common underlying disease among all patients was hypertension (60.2%); then, dyslipidemia (33.9%), diabetes (30.1%), and ischemic heart disease (25.3%). In addition, 14.5% of patients were smokers. Diabetes was significantly more common in CVA (P=0.03). The average blood pressure at the visit was 154.05 ± 30.92 over 92.50 ± 19.82 mmHg. There was a significant relationship between diabetes (P=0.01), high blood pressure (P=0.03), and ischemic heart disease

(P=0.003) with stroke. However, we found no statistically significant relationship between smoking history (P=0.15) and dyslipidemia (P=0.50) with stroke.

Conclusion : Conclusion: our results showed that CVA is correlated with hypertension, diabetes, and ischemic heart disease, which could be considered to be controlled as prevention.

Keywords : Keywords: Cerebrovascular accident, demographics, transient ischemic attack, risk factor

Count: 71
Abstract ID: 344
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Determination of psychometric properties of the Persian version of the stroke self- efficacy questionnaire in stroke patients

Submission Author: Nima Broomand lomer

Fatemeh Dadar[1], Alia Saberi[2], Mozaffar Hosseininezhad[2], Sajjad Saadat[3], Samaneh Ghorbani Shirkouhi[4], Nasim Athari[1], Kasra Sarlak[1], Nima Broomand[1]

1. Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran
2. Department of Neurology, Poursina Hospital, Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran
3. Neuroscience Research center, Department of Neurology, Poursina Hospital, Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran
4. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Background and Aim : Stroke is a neurological disorder caused by the blockage of brain arteries which will lead to injury to the central nervous system (CNS). The Self-Efficacy Questionnaire (SSEQ) is a self-report scale that measures stroke survivors' self-efficacy and covers specific domains of functioning relevant to a person that is affected after a stroke. In this study, our focus was to determine the Persian version of the stroke self-efficacy questionnaire validity and reliability for the first time.

Methods : In this descriptive cross-sectional study, 124 patients with a diagnosis of stroke for the first time, were recruited from the Imam Reza clinic, and Besat clinic of Guilan University of Medical Sciences (Rasht, Iran) in the year 2021. Patients who were in the sub-acute phase (between 2 weeks and 3 months of stroke onset) were included. Demographic, Stroke and physical examination information were recorded in the checklist and patients were asked to answer "13-item stroke self-efficacy questionnaire" and "General self-efficacy scale" (GSE- 10). The reliability of the questionnaire was performed by retesting 30 people with stroke at an interval of two weeks. Internal consistency was also calculated by Cronbach's alpha method in all participants. Statistical analysis was performed by SPSS software version 21.

Results : The Persian version of the SSEQ questionnaire had Cronbach's alpha of 0.901, which confirms the internal consistency of the questionnaire. There is a positive and significant correlation between stroke self-efficacy and general self-efficacy with a coefficient of 0.70 ($P < 0.01$), so the convergent validity of the stroke self-efficacy questionnaire is confirmed using a

related questionnaire. Using confirmatory factor analysis to determine the variables and influential factors proposed in the Persian version of the Stroke self-efficacy questionnaire, its factor structure was confirmed. A total fit index of 0.07 is calculated, indicating that in general the factor model of the present study has a good fit.

Conclusion : The Persian version of the SSEQ questionnaire has acceptable reliability and validity and can be used to assess the self-efficacy of patients with stroke.

Keywords : Stroke; SSEQ; Questionnaire

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Count: 72
Abstract ID: 119
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Effects of Human umbilical cord perivascular cells derived exosomes on ischemia volume and neurological function recovery due to neuroprotection and neural repair following ischemic stroke

Submission Author: Elham Seifali

Elham Seifali[1], Gholamreza hassanzadeh[2], Marzieh Mahdavi pour[3]

1. Department of Anatomy , School of Medicine, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran
2. Department of Anatomy, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Anatomy, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran;

Background and Aim : • Stroke is a life-menacing cerebrovascular condition caused by the interruption of blood flow to a part of the brain leading to neuronal injury and fatality. Increasing affirmation exhibits that exosomes by mediating change of gene expression in target cells have restorative therapeutic effects through transmitting various proteins and Micro-RNA to recipient cells. Exosomes as Nano size particles that compare to mother cells aren't oncogene. Also easily pass from BBB, have higher uptake and they work faster. Novel reports have displayed that exosomal treatment is a noteworthy therapeutic strategy for neuronal injury and neurodegenerative disease. In this investigation we tried to address the effect of hucpvcs (human umbilical cord perivascular cells) - derived exosomes on gene and protein expression of angiogenic and neurogenic factors, functional recovery and protection of nerve tissue from further damage.

Methods : Ischemia was induced by occlusion of the left middle cerebral artery in male Wistar rats. The animals were divided into four groups: sham, ischemia, ischemia + cells, and ischemia + exosomes. Treatment was started 2 hours after induction of ischemia. Measurements were done at day 7 post-MCAO.

Results : Hucpvcs derived exosomes increased gene and protein expression of neurogenic and angiogenic factors BDNF, GDNF, VEGFR2 and VEGF seven days after ischemia (P<0.01). . In addition, the number of MAP2+, Nestin+ and DCX+ cells in the treatment groups with cells and extracellular vesicles increased significantly compared to the ischemia group (P<0.01). There was

a significant decrease in the number of dead neurons in Nissl staining and a decrease in GFAP expression in the borderline area of ischemia compared to the ischemic group (P<0.01) and finally improved sensory-motor function (P<0.01).Perivascular cells derived from umbilical cord showed less neurogenic and angiogenic effects compared to exosomes derived from these cells (P<0.01).

Conclusion : The findings of our study showed that hucpvcs- exosomes cause a decrease in ischemia volume and decrease apoptosis by increasing the expression of neurogenic and angiogenic factors. In addition, neurological function also improved. The strategy of using cell secretions especially exosomes, may be useful in solving the problems in cell therapy in targeting brain diseases.

Keywords : Human umbilical cord perivascular cells; Apoptosis; neurotrophic and angiogenic factor; exosomes; Middle cerebral artery occlusion and ischemia

Count: 73
Abstract ID: 135
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Role of Intra-arterially administered Melatonin on Contralesional vs. Ipsilesional Hemisphere in acute ischemic stroke recovery

Submission Author: Fereshteh Azedi

Fereshteh Azedi[1], Kazem Mousavizadeh[2], Mahsa Sadat Talari[3], Arsh Haj Mohamad Ebrahim Ketabforoush[4], Mohammad Taghi Joghataei[5]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Pharmacology Departement, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
4. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
5. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Following a ischemic stroke, the resulting lesion creates contralateral motor impairment and an interhemispheric imbalance involving hyperexcitability of the contralesional hemisphere. Interestingly, neural reorganization may occur on both the ipsilesional and contralesional hemispheres during recovery to regain motor functionality and therefore bilateral activation for the hemiparetic side is often observed (ipsilateral side switching). Melatonin is a hormone which is secreted from the pineal gland. Since free radicals play a role in the mechanisms of brain injury after ischemic stroke, the effect of melatonin as a potent antioxidant and free-radical scavenger was investigated by several studies after ischemic stroke with emphasis on ipsilesional Hemisphere,however; there isn't any comprehensive study about the effect of melatonin on contralesional hemisphere. Here, we investigated the role of intra-arterially administered Melatonin on contralesional vs. ipsilesional hemisphere at the onset of reperfusion phase in tMCAO rats.

Methods : Stroke was induced by middle cerebral artery occlusion (MCAO) via microfilament method. Brain infarction histological, molecular and neurological evaluation at 1 and 7 day were done. Intar-arterial injection of the melatonin (4 mg/kg) given at the beginning of reperfusion phase was performed.

Results : Administration of Melatonin intra-arterially increased NeuN and decreased GFAP, Iba1 and active caspase-3 at protein level in ipsilateral side of infarction and also in contralateral side.

Furthermore, melatonin elevated BDNF, MAP2, HSPA1A and reduced VEGF at mRNA level $(p<0.05)$ in contralateral side.

Conclusion : Melatonin as a strong antioxidant showed that it can be considered as a agent for stroke treatment by acting on contralateral side of infarction. It can be improve the ability of patient with compensate the infarct hemispehere by increasing BDNF and decreasing cell death. It seems that more reseach about the melatonin act by it's receptors on contralateral side hemisphere may help to better undereestanding of the complex mechanisms of ischemic cascade in stroke.

Keywords : Melatonin, Ishcemic Stroke, Contralesional Hemisphere, Intra-arterial administration

Count: 74
Abstract ID: 76
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Comparison between two routes of fingolimod administration in lysolecithin-induced demyelination model of rat

Submission Author: Sahar Rostami Mansoor

Sahar Rostami Mansoor[1], Tahmineh Gorgani-Firuzjaei[2], Maryam Ghasemi-Kasman[3]

1. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
2. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Multiple sclerosis (MS) is one of the common chronic, disabling neurological diseases, which mostly occurs in young adults. Demyelination and inflammation of the central nervous system (CNS) are the main pathological indications of MS, which contribute to axon injury/loss in the brain and spinal cord. Fingolimod is a potent immunosuppressive compound, which was approved as the first oral therapy for MS in September 2010. The lipophilicity of Fingolimod allows it to cross the blood-brain barrier (BBB) into the brain parenchyma where endogenous sphingosine kinase from neural cells contributes to drug activation. Fingolimod protects the CNS not only by peripheral regulation of the immune system, but also through its direct effects on neural cells and intrathecal immune responses. The major route of drug administration in patients with a neurological disease is oral or parenteral. But several limitations decrease fingolimod efficiency after administration. the intranasal delivery of drugs is a proper and non-invasive route of administration, which bypasses BBB and improves the delivery and bioavailability of drugs in the CNS. Therefore, in the current study we aimed to compare the oral and intranasal administration of fingolimod in lysolecithin-induced demyelination model.

Methods : The experimental model was induced by injection of 2 µL lysolecithin 1% into the optic chiasm of male Wistar rats. The rats were treated by oral gavage or intranasal drop of fingolimod at dose of 0.3 mg/kg for 14 days. Astrocyte activation was analyzed using GFAP immunostaining, extent of demyelination, and myelination levels were measured by fluoromyelin staining, and MOG immunostaining, respectively. Then, the concentration of fingolimod was measured by high performance liquid chromatography (HPLC) method in brain tissues.

Results : Our data showed that intranasal administration of fingolimod significantly decreases astrocyte activation and demyelination levels in the optic chiasm compared to the oral administration route. In addition, the concentration of fingolimod was higher in the brain tissue of IN receiving rats compared to the oral treated group.

Conclusion : Since the concentration of fingolimod was significantly higher in the brains of the intranasal group, it seems that the intranasal route is more successful in increasing the drug bioavailability and remyelination capacity. However, further evidence is needed about bioavailability of fingolimod via the intranasal route and its effects on the central and peripheral immune mediators. Besides, there are still some ambiguities about the best pharmaceutical approaches to promote the intranasal delivery of fingolimod. Therefore, future studies are required to find adequate fingolimod concentration, convenient nasal delivery devices, and proper drug carriers.

Keywords : Fingolimod, Intranasal administration, Astrocyte activation, Demyelination, Myelination

Count: 75
Abstract ID: 206
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Is there an association between multiple sclerosis epidemic and socioeconomic status in Iran? - A descriptive-analytical cross-sectional study

Submission Author: Gilda Khandan Chelarasi

Hossein Mozhdehipanah[1], Monirsadat Mirzadeh[2], Gilda khandan Chelarasi[3], Fatemeh Kazemi[4], Shima Mohammadhoseini Targhi[5], Ali Sarbazi-Golezari[6], Ali Emami[7]

1. Assistant professor, Department of Neurology, Bou Ali Sina Hospital, Qazvin University of medical sciences, Qazvin, Iran.
2. Assistant Professor Community Medicine, Metabolic Diseases Research Center, Research Institute For Prevention Of Non-Communicable Diseases, Qazvin University Of Medical Sciences, Qazvin, Iran
3. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran
4. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran
5. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran
6. Metabolic Diseases Research Center, Research Institute for prevention of Non- Communicable Disease, Qazvin University of Medical Sciences, Qazvin, Iran
7. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran

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. The objective of this study is to determine the relationship between socioeconomic status (SES) and MS severity among Iranian young adults.

Methods : A descriptive-analytical cross-sectional study was conducted by 180 patients (142 females and 38 males) with MS selected by a non-probability and consecutive sampling was conducted 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 degree and the overall neurological function of patients.

Results : The mean age of patients and MS onset was 27.54 and 35.58 years, respectively. The majority of patients were married (68.3%) while were living in cities (74.4%). The mean values of unemployment, homeownership, and monthly income were determined to be 54.4%, 71.7%, and 11,078,330 IRR, respectively. The mean EDSS was 2.80±1.79 points. A weak positive correlation

between EDSS and patients' age (P = 0.001, r = 0.246) and number of children (P = 0.001, r = 0.250) was found. 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 the 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: 76
Abstract ID: 280
subject: Development: Neurogenesis and Gliogenesis
Presentation Type: Oral

Levetiracetam promoted rat embryonic neurogenesis via NMDA receptor-mediated mechanism, in vitro

Submission Author: Hamid Reza Sadeghnia

Hamid Reza Sadeghnia[1]

1. Department of Pharmacology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Levetiracetam (LEV) is a broad-spectrum antiepileptic drug with neuroprotective properties and novel mechanisms of action. Some evidence suggests that LEV may impact adult neurogenesis, but the results are controversial. The present study was aimed to evaluate the effects of LEV on the proliferation and differentiation of rat embryonic neural stem cells (NSCs) and to explore the role of GABAB or NMDA receptors.

Methods : NSCs were isolated from rat fetal ganglionic eminence at embryonic day 14.5. The effects of LEV on viability, proliferation, neurosphere formation, and neuronal or astroglial differentiation of NSCs were assessed using resazurin, BrdU incorporation, immunocytochemistry, quantitative real-time PCR, and western blotting. Additionally, we addressed the relationship between treatment with NMDA and GABAB receptor antagonists (MK801 and saclofen, respectively) in combination with LEV on these parameters.

Results : The data showed that LEV (50 ?M) significantly increased the number ($p < 0.01$) and diameter of neurospheres ($p < 0.05$), enhanced proliferation ($p < 0.01$), and promoted neuronal differentiation, as revealed by significantly increased expressions of DCX and NeuN. On the other hand, the expressions of astroglial markers, GFAP and Olig2, were markedly reduced. The addition of MK801 (10 ?M) significantly diminished neurospheres growth ($p < 0.001$), decreased the number of proliferating cells ($p < 0.01$), and reduced the number of new neurons ($p < 0.001$) but increased the astroglial cells ($p < 0.001$) induced by LEV. Co-treatment with saclofen (25 ?M) did not significantly affect LEV-induced NSCs proliferation and differentiation.

Conclusion : Our findings suggest that LEV may enhance rat embryonic neurogenesis mainly through an NMDA receptor-mediated mechanism.

Keywords : Levetiracetam, Neurogenesis, Neural stem cells, Differentiation, Saclofen, MK801

Count: 77
Abstract ID: 489
subject: Development: Evolution of Developmental Mechanisms
Presentation Type: Oral

The effect of maternal exercise during pregnancy on NR2B receptor expression in the newborn offspring of Wistar rats

Submission Author: Taha Ghantabpour

Taha Ghantabpour[1]

1. Department of anatomy, School of medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : It has been well determined that usual physical activity is good for the cognitive functions and brain health of most individuals, including older and young persons. The reviews showed that exercise leads to recovery in processing speed, counteraction with age-related cognitive decline, and executive function. Addition with its effects on cognitive functions, exercise can improve spatial learning and memory by facilitates synaptic plasticity in the hippocampus. Subsequent its influence on dentate gyrus, it improves both short and long-term potentiation.

Methods : 10 adult males and 10 adult females Wistar rats (220 –250 g) from Experimental Animal Center, Iran University of Medical Sciences, were kept under ambient temperature 21 ± 2 °C, 12-h light/dark cycle with a humidity of $40 \pm 5\%$ and had free access to standard food and water. Before mating, the females were acclimatized to the treadmill exercise. Subsequently, the female rats were divided individually in the home cages and submitted into two groups: The control group (n=5) : sedentary, without exercise. The exercise group (n=5): the rats ran on treadmill at 0º inclination and at a speed 3 m/min for the first 5 min and at a speed 5 m/min for the next 5 min and at a speed 8 m/min for the last 20 min. 6 rat pups of each group were selected and applicated for Real-Time PCR to evaluate hippocampal NR2B mRNA gene expression, and 6 rat pups were applicated to assess the protein level of NR2B in the hippocampus.

Results : The RT-PCR results showed a significant elevation of expression of NR2B in the pups of the exercise group compared to the pups of the control group. Also, the value of NR2B protein was increased in the exercise group compared to control group

Conclusion : As conclusion, the results of this study show that exercise can have functional rules in newborn brains by the influence of the NR2B gene and protein.

Keywords : NR2B ; pregnancy ; exercise

Count: 78
Abstract ID: 367
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Designing and identifying the effectiveness of a Computer-based musical Cognitive program on Hand-eye coordination of children with Autism Spectrum Disorder.

Submission Author: Leila Kashani Vahid

Leila Kashani Vahid[1], Azin Salmin[2], Hadi Moradi[3]

1. Assistant Proffesor, Department of Psychologoy and Special Education, Islamic Azad University, Science and Research Branch.
2. Masters in Psychologoy and Special Education, Islamic Azad University, Science and Research Branch.
3. Professor, School of Electrical and Computer Engineering, University of Tehran.

Background and Aim : The present study was conducted with the aim of designing and identifying the effectiveness of computer music cognitive program on hand-eye coordination of high and moderate autism children.

Methods : This research was semi-experimental and the research design was carried out in the form of pre-test, post-test and follow-up group with two experimental and control groups. The statistical population of the research included all children with autism spectrum disorder in Tehran who were in Avat Autism Center in Andisheh. 30 children with autism were selected using the available random sampling method. From this group, 15 people were in the experimental group and 15 were in the control group. The experimental group was exposed to the intervention of the musical cognitive program. Gars-2 (Gilliam Autism Rating Scale-Second Edition), and Frostig Developmental Test of Visual Perception were used to measure hand-eye coordination. The collected data were analyzed by covariance analysis.

Results : The collected data were analyzed by covariance analysis. The results showed that the use of the computer music cognitive program significantly improved hand-eye coordination of children with autism spectrum disorder have been affected.

Conclusion : It can be concluded that this musical computer game can be used along other rehabilitation methods to improve hand-eye coordination of children with autism spectrum disorder

Keywords : Hand-eye coordination, children with autism, musical computer games.

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Count: 79
Abstract ID: 200
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Designing a minimum data set for autism spectrum disorder registry in Iran

Submission Author: Pardis Jahandideh

Amirhossein Memari[1], Monir Shayestehfar[2], Pardis Jahandideh[3], Rabeeh Hariri[4]

1. Tehran University of Medical Sciences
2. Tehran University of Medical Sciences
3. Tehran University of Medical Sciences
4. Tehran University of Medical Sciences

Background and Aim : The reported prevalence of Autism Spectrum Disorders (ASDs) has been showing a marked increase over the past 20 years for not completely clear causes. Therefore, a uniform data gathering system for ASD registration could prominently enhance plans for managing ASD in the country. So, in the current investigation we aimed to design and validate the Persian version of a minimum data set (MDS) for being administered in the national ASD registry.

Methods : The current study is a mixed-method study with both quantitative and qualitative methods providing and validating a form of MDS in four phases according to Delphi method. The proposed MDS consisted of 11 categories containing coding responses. Content validity (CV) was evaluated based on 20 experts' suggestions and opinions. Item-CV Index (I-CVI) and Scale-CVI (S-CVI) were administered to evaluate and validate the items and questions in the proposed MDS.

Results : Twenty researchers from different disciplines with a mean age of 39.5 ±4.7, scored each question and item. The validity appraisal was provided for each item by computing the I-CVI value by considering the scores. Results showed that 53 out of 76 items had the value I-CVI > 0.78 and were kept as relevant; 23 items were eliminated due to a value below 0.70. The S-CVI/Ave of the relevance for the entire form was 0.9396.

Conclusion : The Persian version of MDS for ASD registry was found to be valid. Such MDS can be utilitarian for health cares and policymaking purposes by gathering and updating standard data for developing local and national registries by means of a set of standardized validated minimum data.

Keywords : Autism spectrum disorder, Minimum data set, MDS, Registry

Count: 80
Abstract ID: 133
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

The association evaluation of oxytocin receptor regulatory region variant with social functioning highlighted the rs2268498 essential role in Theory of Mind ability differences

Submission Author: Rana Ghamari

Rana Ghamari[1], Mehdi Tehrani-Doost[2], Atiye Sarabi-Jamab[3], Seyed-Alireza Etesami[4]

1. Department of Genetics, Faculty of biology, Kharazmi university, Tehran, Iran
2. Department of Psychiatry, Research Center for Cognitive and Behavioral Sciences, Tehran University of Medical Sciences, Tehran, Iran
3. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
4. Department of cellular and molecular Science, RoshdAzma Company, Alborz, Iran

Background and Aim : Difficulties in social interactions and social communication are the leading and permanent characteristics of autism spectrum disorder (ASD) which remain in affected individuals till adulthood. Theory of Mind (ToM) – the ability to attribute a mental attitude to others – is one of the substantial cognitive constituents of social functioning which abnormally developed in autistic patients. The Convergence of several evidence during the past decades reveals that oxytocin and oxytocin receptor (OXTR) is the promising biological components to explain the underlying biological mechanisms of ToM and could potentially address ToM dysfunctions in psychiatric conditions. Up to now, numerous studies demonstrate the association of OXTR genetic variants with a different aspect of ToM abilities either in healthy populations or patients with psychiatric disorders. Therefore, here we aimed to investigate the association of the regulatory region single nucleotide polymorphism (SNP), rs2268498, with verbal and non-verbal ToM in both typically developed (TD) and ASD children and adolescents.

Methods : Forty-four children and adolescents with high-function ASD aged between 8 to 18 years old and 44 matched age and sex TD individuals participated in the study. The blood sample was collected from all participants and rs2268498 were genotyped by PCR RFLP method. Verbal and non-verbal ToM was measured in participants respectively using Happe's Strange Stories and moving shapes paradigm task. Besides, the social responsiveness scale (SRS) questionary was utilized for the assessment of social functioning in subjects. All statistical inferences were performed in the confidence interval of 95% using R programming language and in the RStudio environment.

Results : Group (ASD and TD) and rs2268498 interaction analysis illustrated that in the TD group, the rs2268498 A allele was significantly associated with better performance in Happe's Strange Stories whereas, the rs2268498 G allele was significantly associated with higher scores in non-verbal ToM ability. In addition, our results defined that there was a significant association between SRS social communication subscale and the rs2268498 A allele in the ASD group. However, we did not find any significant differences between SRS subscales and rs2268498 genotypes in the TD group.

Conclusion : Here, we scrutinized the association of rs2268498 with social functioning in ASD and TD subjects. Our findings crystallized the preliminary association of rs2268498 with ToM-related abilities and social communication not only in healthy individuals but also in autistic patients. It could be concluded that rs2268498 might potentially play an outstanding role in the prediction of ToM capacities. Further investigation will be needed to address the association of genetic variants with ToM deficit in ASD.

Keywords : Autism spectrum disorder; Theory of Mind; oxytocin receptor; social functioning; Happe's Strange Stories; moving shapes paradigm

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February 13-14, 2023   **Tehran, Iran**

Count: 81
Abstract ID: 171
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Introducing discriminative functional features for autism spectrum disorder using frequency filters of structural graph

Submission Author: Alireza Talesh Jafadideh

Alireza Talesh Jafadideh[1], Babak Mohamadzadeh Asl[2]

1. Tarbiat Modares University, Department of Electrical and Computer Engineering
2. Tarbiat Modares University, Department of Electrical and Computer Engineering

Background and Aim : This study attempted to answer the question, "Can filtering the functional data through the frequency bands of the structural graph provide data with valuable features which are not valuable in unfiltered data"?. The valuable features discriminate between autism spectrum disorder (ASD) and typically control (TC) groups.

Methods : The resting-state fMRI data was passed through the structural graph's low, middle, and high-frequency band (LFB, MFB, and HFB) filters to answer the posed question. The structural graph was computed using the diffusion tensor imaging data. Then, the global metrics of functional graphs and metrics of functional triadic interactions were computed for filtered and unfiltered rfMRI data.

Results : Compared to TCs, ASDs had significantly higher clustering coefficients in the MFB, higher efficiencies and strengths in the MFB and HFB, and lower small-world propensity in the HFB. These results show over-connectivity, more global integration, and decreased local specialization in ASDs compared to TCs. Increased strength and local connectedness (higher clustering coefficient) in ASDs may suggest impaired network refinement in high-frequency bands of the structural graph. Triadic analysis showed that the numbers of unbalanced triads were significantly lower for ASDs in the MFB. This finding may indicate the reason for restricted and repetitive behavior in ASDs. Also, in the MFB and HFB, the numbers of balanced triads and the energies of triadic interactions were significantly higher and lower for ASDs, respectively. These findings may reflect the disruption of the optimum balance between functional integration and specialization. There was no significant difference between ASDs and TCs when using the unfiltered data. All of these results demonstrated that significant differences between ASDs and TCs existed in the MFB and HFB of the structural graph when analyzing the global metrics of the functional graph and triadic interaction metrics. Also, these results demonstrated that frequency bands of the structural graph could offer significant findings which were not found in the unfiltered data.

Conclusion : In conclusion, the results demonstrated the promising perspective of using structural graph frequency bands for attaining discriminative features and new knowledge, especially in the case of ASD.

Keywords : Autism spectrum disorder, typical control, diffusion tensor imaging (DTI), graph signal processing, resting-state fMRI

Count: 82
Abstract ID: 414
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Emotional and Behavioural problems during COVID-19 Pandemic in Children and adolescents with developmental Disabilities

Submission Author: Fatemeh Hassanati

Fatemeh Hassanati[1], farin soleimani[2], zahrah nobakht[3], zahra ghorbanpour[4]

1. Assistant Professor of Speech Therapy, Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
2. Professor of Pediatrics, Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
3. Assistant Professor of Occupational Therapy, Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
4. Assistant Professor of Occupational Therapy, Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Background and Aim : Children and adolescents with developmental disabilities are a vulnerable group during COVID-19 restrictions, so, they are greater risk of mental health outcomes from COVID-19. The majority of the studies are about mental health of normal children and adolescent. So, the comprehensive knowledge and resources about the mental health problems in children and adolescents with developmental disabilities, is essential to support them and their caregivers as well as to manage such crisis in the future. The aims of this scoping review were: 1. To identify mental health outcomes in children and adolescents with developmental disabilities during the COVID-19 pandemic. 2. To identify correlations, predictors, positive or negative effects, associated with mental health outcomes in children and adolescents with developmental disabilities aged ≤18 years during the COVID-19 pandemic.

Methods : Articles for inclusion in this scoping review were identified by searching the PubMed, Scopus, and Web of Science databases for items dated from 1 January 2020 to 12 September 2022. Observational studies of mental health status of children and adolescents were included.After searching the databases, a total of 882 articles were found. After removing the duplicate articles (n= 261), the titles and abstracts of 621 remaining articles were screened by two independent reviewers in two steps. At first step, they screened the title and abstract of articles. At the second steps, if it's needed, the same two reviewers independently screened the full texts of studies to verify that they met the eligibility criteria. In cases of disagreement, a third researcher was consulted to reach a final decision.

Results : fourteen studies were selected for inclusion. The findings highlight that across most studies, the prevalence of mental health problems, behavioral problems, and wellbeing during the COVID-19 was significantly increased in comparison of pre-COVID-19 and the control groups.

Conclusion : This review highlights the presence of several mental health problems during the COVID-19. The findings point to the need for comprehensive attention to plan and implement strategies to provide access to mental health services for children and adolescents with developmental disabilities.

Keywords : Developmental Disabilities, Mental Health, COVID-19, Children, Adolescent, ADHD, Autism spectrum disorder, neurodevelopmental disorders

Count: 83
Abstract ID: 429
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

The Neonatal APGAR as a Neural Index,, Effected by Pregnant Mothers' Sleep Quality in the Last Month of Pregnancy? A Pilot Study Draw Near for a Cohort Study

Submission Author: Mohammadjavad Hoseinpourfard

Mohammadjavad Hoseinpourfard[1], Narges Pourtaleb[2], Hosein Vejdanparast[3]

1. Department of Children and Adolescents Clinical Psychology, Roshdiyeh Higher Education Institute, Tabriz, Iran.
2. Department of Children and Adolescents Clinical Psychology, Roshdiyeh Higher Education Institute, Tabriz, Iran.
3. Department of Children and Adolescents Clinical Psychology, Roshdiyeh Higher Education Institute, Tabriz, Iran.

Background and Aim : Public health depends on the health of the family. The health of mothers and newborns is one of the most important aspects of family health. This study aims to investigate the relationship between a mother's sleep quality and neonatal weight and their APGAR index. The statistical population in this study is the pregnant mothers and their newborns who were referred to Tabriz health care service provider centers for delivery.

Methods : Mothers have chosen voluntarily. In addition, after obtaining permission from the hospital, the sample selection made by the available sampling method. The sample size based on Morgan's table is 169 cases; the subjects will complete the Pittsburgh sleep quality standard questionnaire. After that, the data analysis at the descriptive level, and the significant observation about variables obtained from the results presented.

Results : At the level of descriptive statistics, the relationship between predictor variables and the criterion, using the Pearson correlation test explained.

Conclusion : Neonatal and mother-care health aspects necessaries must be focused on the sleep quality in the last month of pregnancy

Keywords : Sleep Quality; Pregnant Mothers; Neural Neonatal Index; APGAR;PSQI.

Count: 84
Abstract ID: 479
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Impact of maternal reduced uteroplacental perfusion on the expression of hippocampal AMPA receptors in rat offspring

Submission Author: Mehran Hosseini

Mehran Hosseini[1], Davood Dorranipour[2], Khadijeh Vazifeshenas-Darmiyan[3]

1. Department of Anatomical Sciences, Kerman University of Medical Sciences
2. Department of Anatomical Sciences, Kerman University of Medical Sciences
3. 2. PhD candidate in Clinical Biochemistry, Faculty of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Background and Aim : Preeclampsia is a common pregnancy complication. Previous studies suggest that it may exert long-lasting cognitive effects. More recent studies revealed that dysregulation in AMPA-type glutamate receptors (AMPARs) has been associated with the pathogenesis of several neurodegenerative diseases, especially during their early phase. The aim of this study was to investigate the hippocampal expression of AMPARs in offspring born to reduced uteroplacental perfusion (RUPP) rat preeclampsia model.

Methods : Thirty timely pregnant Wistar rats were randomly allocated into three groups: control (n=8), sham (n=10) and RUPP (n=12). RUPP or sham procedures were performed on day 14 of gestation. After parturition, the litter size of all groups was adjusted to 6 pups per dam. On postnatal day 14, the mRNA expressions of AMPA-Rs subunits (Gria1-2) were evaluated by RT–PCR. In addition, the expression and localization of GluA1,2-containing AMPA-Rs in their hippocampi were investigated immunohistochemically.

Results : Compared to the sham group, hippocampal mRNA expression of the Gria1 was significantly reduced (p=0.017), while the expression of Gria2 was increased (p<0.001) in the RUPP pups. The immunohistochemical assessment showed significant decreases in the immunoreactivity of GluA1-containing AMPA-Rs in the CA1 and dentate gyrus (DG) hippocampal subfields of the RUPP pups (p<0.001 both). On the other hand, the immunoreactivity of GluA2-containing AMPA-Rs was significantly increased in both CA1 and DG hippocampal subfields of the RUPP pups (p<0.001 both). No significant differences in the expressions of GluA1 and GluA2-containing AMPA-Rs in the CA3 region were observed in the studied groups.

Conclusion : This study is the first to report that maternal RUPP could modulate GluA1,2-containing AMPARs dysregulation in a rat. It might be useful for further studies on the neuronal development of newborns born to preeclamptic mothers.

Keywords : Preeclampsia; Offspring; AMPA receptors; Neurodegenerative diseases

Count: 85
Abstract ID: 265
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

The role of orexin receptor type 1 of the basolateral amygdala in the innate-fear induced analgesia in the Male Rats

Submission Author: Mahnaz Aghaei

Mahnaz Aghaei[1], Dr. Roghayeh Khakpay[2], Mohammadali Hosseinpour Feizi[3], Fatemeh Khakpay[4]

1. Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
4. 2. Cognitive and Neuroscience Research Center (CNRC), Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

Background and Aim : An encephalic aversion system (EAS) is made up of the amygdaloid complex, medial hypothalamus, periaqueductal gray, and superior and inferior colliculi deep layers, which constitute the encephalic aversion system. Anxiety and fear are unconditioned aversive states that can be integrated via the encephalic aversion system (EAS). In terms of the neural organization of the EAS, the amygdala and the medial hypothalamus are upstream. Particularly, the amygdala plays an important role in processing stimuli and storing memories. Negative affect and pain appear to be reciprocal in that patients suffering from depression and anxiety feel pain more, whereas stress and fear inhibit pain. The DMH/VMH suggests that anxiety and panic-like defensive behaviors are influenced by GABA-mediated neurotransmission.

Methods : In total, 49 Wistar rats were randomly divided into seven groups: control, bicuculline/control, bicuculline/saline, bicuculline/DMSO/Saline, bicuculline/orexinA, bicuculline/DMSO/Orexin A, bicuculline/SB 0.1 nM/Orexin A. Stereotaxic surgery was used for both intra-BLA and intra-DMH/VMH nuclei cannulation. In order to assess the innate fear induction, the following behaviors were observed over a period of 10 minutes with a camera. The innate fear-evoked behaviors were primarily assessed by an open field test five minutes after the injection of bicuculline in the intra-DMH/VMH. The innate fear-evoked behaviors were primarily assessed by an open field test five minutes after the injection of bicuculline in the intra-DMH/VMH. Immediately after open field test completion, In order to investigate the role of type 1 orexin receptors in the neutralization of induced analgesia with stress, orexin A was injected into the nucleus of the BLA five minutes before orexin type 1 receptor antagonist (SB 0.1 nM) was injected into this nucleus. Then five minutes later, formalin was injected, and immediately, pain

behaviors brought on by formalin were investigated for sixty minutes. At the end of the tests, animals were killed and their brains were removed and examined for the correct cannula implantation in the DMH/VMH and BLA nuclei.

Results : As a result of intra-DMH/VMH injection, defensive attention and immobility ('freezing') were significantly increased as well as rearing (upright posture) and jumping behavior. The results of this study confirmed the innate fear induction. BLA nuclear pretreatment with a 0.1 nM dose of SB334867 could not induce hyperalgesia from the injection of orexin A into the nucleus of the BLA during the first phase of the formalin test, and the hyperalgesia effect caused by orexin A was completely preserved so that the increase in the frequency of Flinches the compared to the bicuculline/control group ($P < 0.01$), duration of Flexing compared to the BIC/DMSO/Saline ($P < 0.05$) and duration of Licking compared to the bicuculline/control ($P < 0.01$), BIC/DMSO/OXA ($P < 0.05$), BIC/DMSO/Saline($P < 0.01$) showed a significant increase. Effect of SB 0.1 nM/OXRA injection into BLA nucleus on stress-induced analgesia (SIA) in formalin test had no effect on the late phase.

Conclusion : The analgesic effect of endogenous orexin is mediated by type 1 orexin receptors. Therefore, orexin type 1 receptors don't involve the neutralizing effect of orexin A on innate fear-induced analgesia.

Keywords : SB334867, DMH/VMH nuclei, hyperalgesia ,Bicuculline, innate fear, SIA, BLA nuclei.

Count: 86
Abstract ID: 379
subject: Motor Systems
and Movement Disorders: Motor Neurons and Muscle
Presentation Type: Oral

Investigating the therapeutic effect of High-Intensity Interval Training and Neural Stem Cell implantation on the Contusive Model of Spinal Cord Injury in Rats

Submission Author: Reza Keikhaei

Reza Keikhaei[1]

1. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Spinal cord injury (SCI) leads to loss of motor and sensory function, inflammation, axonal degeneration, and gliosis. A combined treatment of exercise and neural stem cells (NSC) has been suggested to improve neural restoration. This study evaluated a combined therapy of high-intensity interval training (HIIL) with neural stem cells on a contusive model of spinal cord injury in rats.

Methods : In vitro section, rat adipose-derived stem cells (ADSCs) were isolated from perinephric regions of Sprague–Dawley rats using enzymatic digestion. The ADSC was transdifferentiated into neurospheres using B27, EGF, and bFGF. After production of NSC, they were labeled using green fluorescent protein (GFP). For the in vivo study, rats were divided into eight groups: control group, sham operation group, sham operation + HIIL group, sham operation + NSC group, SCI group, SCI + HIIL group, SCI + NSC group, and SCI/HIIL/NSC group. Laminectomy was carried out at the T12 level using the impactor sys¬tem. HIIL was performed three times per week. In order to assess behavioral function, the Basso-Beattie-Bresnahan (BBB) locomotor test and H-reflex was carried out once a week for 12 weeks. We examined glial fibrillary acidic protein (GFAP), S100β and NF200 expression.

Results : The percentage of immunoreactive NSCs to nestin, NF68, Sox2, and Oct4 were significantly higher than the differentiated neuron marker (Neun), $p<0.05$ (2I). A high number of GFP-positive NSCs were integrated after transplantation. NSC transplantation and HIIL improved loco-motor function with decreased H/M ratio and increased the BBB score.

Conclusion : Combined therapy using the HIIL protocol and neurosphere-derived NSC transplantation in contused rats enhances functional and histological outcomes.

Keywords : Neural stem cells (NSCs), Neurospheres, High intensity interval training (HIIL)

Count: 87
Abstract ID: 424
subject: Motor Systems
and Movement Disorders: Cerebellum and Basal Ganglia
Presentation Type: Oral

Melittin administration ameliorates motor function, prevents apoptotic cell death and protects Purkinje neurons in the rat model of cerebellar ataxia induced by 3-Acetylpyridine

Submission Author: Reza Bahar

Reza Bahar[1], Abbas Aliaghaei[2]

1. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Cerebellar ataxia (CA) is a condition in which cerebellar dysfunction leads to movement disorders such as dysmetria, asynergy and dysdiadochokinesia. This study investigates the therapeutic effects of Melittin (MEL) on 3-acetylpyridine-induced (3-AP) cerebellar ataxia (CA) rat model.

Methods : Initially, CA rat models were generated by 3-AP administration followed by the intraperitoneal injection of MEL. Then, motor performance and electromyography (EMG) activity were assessed. Afterwards, the pro-inflammatory cytokines were analyzed in the cerebellar tissue. Moreover, the anti-apoptotic role of MEL in CA and its relationship with the protection of Purkinje cells were explored.

Results : The findings showed that the administration of MEL in a 3-AP model of ataxia improved motor coordination ($P<0.001$) and neuro-muscular activity ($p<0.05$), prevented the cerebellar volume loss ($P<0.01$), reduced the level of inflammatory cytokines ($p<0.05$) and thwarted the degeneration of Purkinje cells against 3-AP toxicity ($P<0.001$).

Conclusion : Overall, the findings imply that the MEL attenuates the 3-AP-induced inflammatory response. As such, it could be used as a treatment option for CA due to its anti-inflammatory effects.

Keywords : Melittin; Cerebellar ataxia; Neuroprotection; Inflammation; Motor skills

Count: 88
Abstract ID: 419
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Classification of Neurodegenerative Disease with Fusion of Recurrence Quantification Analysis and statistical features

Submission Author: Negar Monfared

Negar Monfared[1], Ali Maleki[2]

1. Ph.D. Candidate, Biomedical Engineering Department, Semnan University, Semnan, Iran
2. Associate Professor, Biomedical Engineering Department , Semnan University, Semnan, Iran

Background and Aim : The key objective of this research is to classify neurodegenerative patients using classification techniques. Neurodegenerative diseases (NDD) including Amyotrophic Lateral Sclerosis (ALS), Parkinson's disease (PD), and Huntington's disease (HD) can be defined as the degeneration in the structure of neurons in the human body. Progressive brain disorder leads to severe gait abnormalities in humans. An accurate diagnosis of the particular brain disorder helps to start early treatment procedures. To detect brain disorders, machine learning-based techniques are needed for accurate and non-invasive diagnosis and classification of NDD and healthy control (HC) subjects. According to the state-of-the-art methods performed using ground reaction force signal along with the extraction of temporal, statistical, and frequency characteristics, patients with NDD were able to separate. In order to improve the classification accuracy, recurrence quantification analysis (RQA) which represents the nonlinear dynamics of gait can be recruited.

Methods : In this article, the classification of neurodegenerative diseases has been discussed by using the features of quantitative analysis of recurrence along with statistical features. The methodology includes data preprocessing, statistical feature extraction, RQA feature extraction, feature selection and classification. For this purpose, the neurodegenerative disease gait database in physionet has been used, which include ground reaction force (GRF) signals of 64 individuals, i.e., 15 PD, 20 HD, 13 ALS and 16 HC subjects. To improve the signals, the first and last 15 seconds of data containing noise were removed. Statistical and RQA features were extracted from the signals of left and right legs to quantify gait parameters. We get the statistical features including mean, standard deviation, skewness, kurtosis and the RQA feature including recurrence rate, determinism, averaged diagonal length, length of longest diagonal line, entropy of diagonal length, laminarity, trapping time, length of longest vertical line, recurrence time of 1st type, recurrence time of 2nd type, recurrence period density entropy, clustering coefficient and transitivity. Then

sequential feature selection (SFS) technique was implemented on feature set for reducing the dimensions of the features. All simulations were implemented under Matlab software and 5-fold cross validation was used . Classification in two classes, including the separation of diseases from healthy people, also, the separation of disease classes and healthy people in 4 classes were done using cubic SVM classifier and the results were evaluated using the accuracy index.

Results : The best classification accuracies for the healthy controls (HC) vs Parkinson's disease (PD), HC vs. Huntington's disease (HD), HC vs. amyotrophic lateral sclerosis (ALS), HC vs. PD vs. HD vs. ALS, were 97.2%, 95.8%, 98%, and 93% with Cubic SVM.

Conclusion : The main goal of this work is to quantitatively analyze the normal and pathological gait GRF signals. In order to improve the results of NDD classification in the proposed method, RQA and statistical features were recruited simultaneously and SFS feature selection method was used. RQA has been proven to be one of the best tools for non-linear, non-stationary, and short data analysis. The combination of these features allows early and effective diagnosis, which leads to faster recovery of patients and better diagnosis of specialists.

Keywords : Neurodegenerative Diseases; Recurrence Quantification Analysis (RQA); Sequential feature selection; Classification.

Count: 89
Abstract ID: 36
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

The effects of gallic acid on motor function, intestinal transit, brain electrophysiology and oxidative stress alterations in an animal model of Parkinson's disease induced by gastrointestinal toxicity

Submission Author: Elnaz Sheikhpour

Elnaz Sheikhpour [1]

1. Department of Physiology, Medicine Faculty, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : The neuropathology of Parkinson's disease (PD) is complex and affects multiple systems of the body beyond the CNS. In this study, the effects of gallic acid (GA) and gastrointestinal vagotomy (VG) evaluated on motor, cognitive, intestinal transit time and thalamic nuclei electrical power in an animal model of PD induced by rotenone.

Methods : Male Wistar rats divided into 5 groups; Sham, Rot, ROT+GA, VG+ROT. Rats in sham received vehicle, in ROT received rotenone (5 mg/kg/2ml, ig), in ROT+GA; PD rats treated with GA (100 mg/kg, gavage/once daily, for 28 days). In VG+ROT vagal nerve was dissected. Stride length, motor coordination, and locomotion, intestinal transit time, cognitive and pain threshold, thalamic local EEG were evaluated. Oxidative stress indexes in striatal tissue were measured.

Results : Rotenone diminished significantly the stride length (*** $p < 0.001$), motor coordination (***$p < 0.001$), power of thalamic EEG (** $p < 0.01$) and pain (***$p < 0.001$). MDA increased significantly (*** $p < 0.001$) and GPx activity decreased (*** $p < 0.001$). Intestinal transit time increased significantly (**$p < 0.01$). Treated PD rats with GA significantly improved all above disorders (### $p < 0.001$, ## $p < 0.01$). Vagotomy prevented significant alterations of motor and non-motor parameters by rotenone.

Conclusion : Current findings suggest rotenone acts as a toxin in GI and play a role in the pathogenesis of PD through gastric vagal nerve. So, vagotomy could prevent the severity of toxicity by rotenone. GA improved symptoms of PD-induced by reotenon. Therefore, GA can be as a promise therapeutic for PD patients

Keywords : Rotenone; Parkinson's disease; Gallic acid; Vagotomy; EEG; Intestinal transit time.

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Count: 90
Abstract ID: 163
subject: Motor Systems
and Movement Disorders: Other
Presentation Type: Oral

Matrigel enhances differentiation of human adipose tissue-derived stem cells into dopaminergic neuron

Submission Author: Forouzan Absalan

Forouzan Absalan[1]

1. Medical Faculty, Abadan University of Medical Sciences

Background and Aim : Therapy based stem cells have offered a novel therapeutic approach for the improvement of neurodegenerative diseases, specially Parkinson. Hence, developing a well-established culture model with appropriate stem cells is extremely crucial in regenerative engineering to provide efficient targeted cells. Human adult mesenchymal stem cells derived from adipose tissue (hADSCs) have emerged as a promising source of stem cells due to their unique potentials of self-renewal and differentiation into other stem cells. The purpose of this study was to investigate the differentiation capacity of hADSCs into dopaminergic and neuron-like cells in the 3D culture plate (Matrigel).

Methods : hADSCs were obtained from adipose tissues of patients and then characterized morpho logically with flowcytometry. Isolated cells were harvested to perform differentiation on Matrigel and tissue culture plate (TCP) supplemented with induction factors. The survival rate of cells during neural induction was monitored by MTT. The expression of specific cell markers was analyzed by QRT-PCR and immunocytochemistry on days 2, 8 and 14. The level of released dopamine was measured using HPLC technique.

Results : Matrigel had a positive effect on maintaining cell growth compared to those on TCP. Moreover, the number of TH and MAPII positive cells is substantially higher in Matrigel than in TCP. Sox2 and Nestin had a prominent expression in hADSCs within the first days of differentiation. The gene expression of neural markers such as TH, Nurr1, LMX1A and DAT was detected and increased after day 8. Moreover, the dopamine released in the cell harvested on Matrigel was greater than those seeded on TCP.

Conclusion : Overall, hADSCs could generate dopaminergic cells, which suggest its strong capability to serve as a tool for Parkinson disease model in the regenerative medicine.

Keywords : Human adipose tissue-derived stem cells Differentiation 3-Dimensional Dopaminergic neuron

Count: 91
Abstract ID: 168
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Oral

Differentiation between progression from pseudoprogression in glioblastoma using diffusion Weighted imaging techniques

Submission Author: Yasaman Bastanipour

Yasaman Bastanipour[1], Mohammadali Oghabian[2], Samira Raminfard[3]

1. Master of Medical Imaging Technology, Tehran University of Medical Sciences
2. Professor of Tehran University of Medical Sciences
3. PHD in neuroscience and researcher in neuroimaging and analysis group at Emam Khomeini hospital of Tehran

Background and Aim : Glioma is the most common type of intracranial tumor. Today, surgery followed by radiation therapy is the best treatment for high-grade glioma. Unfortunately, the effects of radiation therapy in T1 images after injection have an appearance similar to a true progression, which hinders correct diagnosis. Early diagnosis of the effects of radiotherapy after treatment increases confidence in the continuation of the current treatment method and prevents unnecessary surgery. Since conventional MRI techniques were useless in differentiating between tumor recurrence and the effects of radiotherapy after treatment, advanced functional magnetic resonance imaging methods such as MRS, DWI and PWI have been used to detect glioma recurrence from the effects of radiotherapy after treatment. The purpose of this study is to investigate the diagnostic value of different diffusion parameters, especially the MK parameter, and compare it with the results of MRS and pathology as a standard for distinguishing true recurrence of glioblastoma from pseudoprogression.

Methods : 19 glioblastoma patients who had a new lesion with absorption of contrast material after surgery and radiotherapy were subjected to conventional MRI, DKI and multivoxel MRS imaging. Based on pathology findings and radiologist's opinion, 13 patients had true recurrence and 6 patients had pseudoprogression of glioblastoma. FA, MD and MK parameters based on the areas with absorption of contrast material in T1 images after injection, once in voxels with a volume of approximately 2.34 cm3 and corresponding to the MRS voxel and again in a smaller voxel with a volume of 0.004 cm3 was calculated. The mean differences of diffusion parameters between true recurrence and pseudoprogression of glioblastoma were compared using the Mann-Whitney test. The receiver operating characteristic curve was used to evaluate the differential detection efficiency of each parameter.

Results : In the selected ROI with a volume of 2.34 cm3, none of the diffusion parameters were significant between the two groups of pseudoprogression and true recurrence of glioblastoma. In the selected ROI with a volume of 0.004 cm3, MK parameter between these two groups was significant with p-value=0.01. ROC analysis showed that MK parameter with AUC=0.93 with sensitivity of 69% and specificity of 100%, also FA with AUC=0.67 and sensitivity of 67% and specificity of 69.2% and MD with AUC=0.64 with sensitivity of 83.3% and specificity of 53.8% It is able to distinguish between the true recurrence of glioblastoma and its false recurrence. The result of MK parameter in voxel with smaller volume in 78% of patients was consistent with MRS and pathology results. This value for MD and FA parameters was 63 and 53%, respectively.

Conclusion : MK parameter has more sensitivity, specificity, accuracy, NPV and PPV than other studied diffusion parameters in differentiating true recurrence from pseudoprogression of glioblastoma in small ROI investigation. Also, in examining the correlation between diffusion parameters and Cho/NAA ratio in small ROIs, the MK parameter showed the highest correlation among diffusion paramet ers, and since it follows MRS results better, in examining smaller lesions (in the early stages of recurrence) that MRS has little validity, this parameter can be helpful.

Keywords : glioblastoma; DKI; DWI; true progression; pseuprogression

Count: 92
Abstract ID: 359
subject: Computational Neuroscience: Computational Tools
Presentation Type: Oral

Sleep Depth Estimation Using Cortical Effective Connectivity Analysis

Submission Author: Aminollah Golrou

Aminollah Golrou[1], Mohammad Reza Saebipour[2], Mahdieh Sabouri[3]

1. PhD in Biomedical Engineering, Birjand University of Medical Sciences
2. MD PhD of Neuroscience, Birjand University of Medical Sciences
3. PhD candidate in Electrical Engineering, Birjand University

Background and Aim : Sleep quality has a multidimensional construction, having both subjective and objective components. The relative contributions of objective components to the conceptual construct of sleep quality remain poorly understood and relationship between physiologic measures of sleep and cognitive and physical performance are similarly ill defined. The determination of "quality sleep" remains largely subjective and inconsistently quantifiable by current measures. Methods evaluating sleep as a continuous measure rather than traditional sleep stages may provide an innovative approach to future studies of sleep and performance. Breakdown of effective connectivity during deep sleep has been proven before by several researchers, who applied Transcranial Magnetic Stimulation (TMS) for measuring the connectivity.

Methods : As a try for quantifying sleep quality using an objective measure, we proposed an Index for sleep quality measurement based on the strength and distribution of effective connectivity across the EEG channels during different sleep stages. We estimated the connectivity strength and distribution using a nonlinear approach of effective connectivity that we developed and published in 2018 based on nonlinear neural networks. Based on this theory, we proposed a quantifier as follows, based on the total amount of effective connectivity across the EEG channels, which quantifies sleep quality in terms of the decreasing and localization of effective connectivity at the same time as the SWS sleep stage occurs.

Results : As we know, slow wave sleep is correlated with better sleep quality because of the restorative activity during SWS, so we developed an objective sleep quality measure based on the amount of effective connectivity decreasing and localization during NREM sleep. As the subject's sleep becomes deeper, the value of this quantifier increases with the overall reduction of the amount of effective connectivity and localization of connectivity between neighboring channels. Our findings from the graph of this quantifier showed that: A) The highest value of this quantifier was obtained simultaneously with the localization and weakening of effective connectivity during

the SWS. b) The trend of increasing the value of the proposed quantifier before the start of the SWS sleep stage is evident. c) The highest values of proposed quantifier occurred in the first half of sleep, and moving towards the end of sleep, the value of this quantifier faced a greater drop, which is due to the decrease in the duration of the SWS in the second half of sleep.

Conclusion : Our findings showed that the effective connectivity decreased and localized during slow wave sleep and this finding confirmed the previous studies in this field. as far as we know, this is the first index in this regard, which also can be considered as the objective sleep depth index. Objective sleep quality indices studies which simultaneously assessed physiologic sleep measures and subjective sleep perception and investigating the correlation between objective and subjective sleep quality outcomes concurrently in the same individuals, can be considered in future studies.

Keywords : Sleep Depth Estimation, Brain Connectivity, Sleep EEG, Cortical Effective Connectivity

Count: 93
Abstract ID: 169
subject: Computational Neuroscience: Computational Tools
Presentation Type: Oral

Improving the performance of P300-based BCI systems using regularized spatiotemporal beamforming and EEG signals

Submission Author: Asghar Zarei

Asghar Zarei[1], Babak Mohammadzadeh Asl[2]

1. Department of Biomedical Engineering, Tarbiat Modares University, Tehran, Iran
2. Department of Biomedical Engineering, Tarbiat Modares University, Tehran, Iran

Background and Aim : A P300 brain-computer interface (BCI) is a paradigm in which the subject's intentions are decoded from event-related potentials (ERPs). The spatiotemporal beamformer model and its extended versions are linear decoding models that can provide state-of-the-art classification accuracy. Although the training time of the beamformer-based models is generally low, they need a substantial amount of training data to provide reliable classification performance. In other words, the original spatiotemporal beamformer-based models lose their performance in the short BCI calibration sessions.

Methods : To address this problem, we introduced a novel covariance estimator for providing robust and more accurate beamformer weights in the presence of limited training data. The proposed covariance estimator uses the maximum likelihood (ML) technique to calculate a better estimate of the covariance matrix. In the ML method, a new sparsity constraint is considered to express the specific eigendecomposition of the covariance matrix as a sparse matrix transform (SMT). Then, the SMT is calculated using the product of pairwise coordinate rotations. These rotations can be constructed by a cross-validation method. The performances of the implemented methods are evaluated using a P300-based BCI dataset recorded from 21 subjects and four-fold cross-validation technique. Also, the performance of the proposed SMT-based beamformer is compared with the original spatiotemporal beamformer to show the additional advantage of the proposed estimator. In addition, the performance of beamforming-based classifiers is compared with support vector machine (SVM) and K-nearest neighbor (KNN) models in terms of classification accuracy and training time criteria.

Results : Experimental results show that the suggested method can efficiently improve the performance of the original spatiotemporal beamformer in the presence of limited training data. In other words, the introduced beamformer provides higher ERP classification accuracy compared to the conventional spatiotemporal beamformer. The proposed method provides an average

classification accuracy of 69.85% and 98.81% using one and 10 stimulation repetitions, respectively. The results showed that by providing a better estimate of the covariance matrix, the proposed method improves the average classification accuracy by 9.80% compared to the original spatiotemporal beamformer. In addition, the results showed that in terms of classification accuracy, the proposed method has better performance than the state-of-the-art classifiers such as SVM and KNN models. Also, the introduced SMT-based spatiotemporal beamformer needs only a fraction of the time needed to train the SVM and KNN models.

Conclusion : Finally, the results show that our proposed method performs significantly better than the original spatiotemporal beamformer in all stimulation repetitions and this method could be used as a non-invasive alternative over the conventional technique.

Keywords : brain-computer interface (BCI), spatiotemporal beamforming, sparse matrix transform (SMT), EEG signals

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 94
Abstract ID: 216
subject: Neurorehabilitation and Regeneration: Physiotherapy
Presentation Type: Oral

Effects of Rehabilitation on Wrist Active Range of Motion in Chronic Post-Stroke Patients: A Narrative Review

Submission Author: Seyed Mohammad Jafar Haeri

Seyed Mohammad Jafar Haeri[1], Seyedeh Saeideh Babazadeh-Zavieh[2], Noureddin Nakhostin Ansari[3]

1. Assistant Professor, Department of Anatomy, Medical School, Arak University of Medical Sciences, Arak, Iran.
2. Assistant Professor, Department of Physical Therapy, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran
3. Professor, Physical Therapy Department, School of Rehabilitation, Tehran University of Medical Sciences, Tehran , Iran

Background and Aim : Despite current rehabilitative strategies, stroke is a leading cause of disability in the world. All neurological disorders caused by stroke may limit the range of motion (ROM) and function of patients from mild to severe. Re-establishment of ROM, especially active ROM, function, and pre-stroke motor skills by stimulating neuroplasticity are the most important goals of stroke rehabilitation. The common rehabilitation techniques in improving these patients are stretching, neurophysiological movement therapy, task-specific training, constraint-induced movement therapy, electrical stimulation, and etc. The wrist is one of the most important joints affected by stroke and plays an important role in upper limb function. Spasticity of wrist flexors and paralysis of wrist extensors are two factors in hand dysfunction. The aim of this study was to present a brief review regarding the effectiveness of some rehabilitation techniques in improvement of post-stroke hand function particularly wrist active extension ROM.

Methods : Searches were performed in PubMed, PEDro, Science Direct, and Scopus databases until August 2022.

Results : There are some controversies about the effectiveness of the non-invasive techniques on the improvement of wrist active ROM and function in post-stroke patients. Stroke is associated with an upper motor neuron (UMN) lesion, and the clinicians expect low improvement in an active function in the chronic phase of stroke. Also, in the chronic phase of stroke, the paralysis/weakness of wrist extensor muscles contribute considerably in impairments of wrist active movements.

Conclusion : Our results showed that most of non-invasive techniques could not clinically improve wrist active ROM and consequently hand function. This indicates in the UMN lesions after stroke the amount of neuroplasticity and healing in upper motor circuits following common rehabilitation techniques is limited.

Keywords : Rehabilitation, Wrist, Active range of motion, Stroke

Count: 95
Abstract ID: 238
subject: Neurorehabilitation and Regeneration: Physiotherapy
Presentation Type: Oral

The effectiveness of Physical Treatment and Rehabilitation on Recurrence of Thoracic Outlet Syndrome

Submission Author: Najmeh Sadat Boland Nazar

Najmeh Sadat Boland Nazar[1], Farhad Torfi[2], Mohammad Hasani[3], Rashin Malek Mahmoodi[4], parvin Momeni[5], Rasa Salmani[6]

1. Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. surgical Ward, Taleghani Hospital, Shahid Beheshti University of Medical Science, Tehran, Iran
3. Surgical Department,Taleghani Hospital,Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Physical therapy Department,Iran University of Medical science,Tehran,Iran
6. Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Thoracic outlet syndrome (TOS) includes disorders caused by compression of the neurovascular structures in the upper thoracic outlet. Depending on the compressed structure, it is categorized into neurological,n TOS, arterial and venous TOS

Methods : A 31 years old female presented to a physiatrist with a three years history of left upper limb pain and paresthesia. Evaluations showed neurogenic thoracic outlet syndrome (nTOS) due to cervical rib. Decompression surgery was performed and all symptoms improved after surgery. After a year, the patient presented to the surgeon with recurrence of the same symptoms. Her workup was consistent with nTOS and cervical radiograph showed regrowth of cervical rib. Conservative treatment including myofascial release, acupuncture, physical therapy, and home exercise was performed.At first step, therapist applied skin rolling and trigger point release techniques to limit muscular constriction by freeing the myofascial restriction within shoulder girdle and cervical spine. Trigger point release technique, sustained pressure to tender muscle, was utilized with finger pads to the scapulothoracic muscles, particularly levator at the superior angle of the scapula and upper trapezius. Skin rolling technique, rolling, pulling, and manipulation of the skin over taut muscle, was utilized with soft pads of thumbs and fingers to gently pick up and hold a roll of skin near the base of spine and then slowly roll up. After that, the patient lay prone position and acupuncture points on the trigger points and left hand were selected. Left hand acupuncture points stimulated were LI-4 (Hegu), LI-11 (Quchi), LI-14 (Biano), LI-15 (Jianu), and

San jiao 5. At each point, a filiform needle (0.25cm in diameter) was inserted. The depth of insertion varied from 10mm to 20mm based on the thickness of the muscles. Needles were retained for 30 minutes with twisting manual stimulation for 10 seconds at 10 minutes intervals. At third step, physical therapy was initiated with the patient attending a total of nine session. Program involved forward head posture correction education, mid to upper thoracic, cervicothoracic junction, and lower to mid cervical mobilization, cervical retraction range of motion exercise, stretching of scalene and pectoralis minor muscle, and strengthening of lower trapezius and serratus anterior.Finally, daily home exercise program added for self-care included postural advice, active ROM, Stretching, and strengthening

Results : At the beginning of conservative treatment, patient's pain and paresthesia intensity measured via VAS scale, which was 8 out of 10. After 8 weeks of intervention, patient's pain and paresthesia intensity according to the VAS scale was 3. Activity of daily living, measured via Modified Barthel Index, improved from slight dependence (Score: 94) to independence (Score: 100).

Conclusion : Conservative treatment may be an effective alternative to surgery for nTOS.

Keywords : nTOS, conservative treatment, myofascial release,acupuncture

Count: 96
Abstract ID: 437
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Oral

The Effect of Speaker's Gender and Familiarity on the Perception of words/nonwords by Preschool children

Submission Author: Safa Hamid

Safa Hamid[1], Behnoosh Tahanzadeh[2], Peyman Zamani[3], Maryam Najarzadeh[4]

1. Department of Speech Therapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
2. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Department of Speech Therapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Department of Speech Therapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
4. Department of Speech Therapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : In the neuropsychological point of view, the process of decoding auditory speech signals into concepts that can be understood by the listener is called the process of auditory perception. Auditory perception plays an important role in the development of spoken language, phonological awareness and literacy. This study aims to answer the question "How much the parents as familiar speakers alongside strangers influence the child's auditory perception of real words and non-words?"

Methods : This cross-sectional study was conducted in two stages. This study was administered in fifty normal four to six years old children (twenty-seven under-examined girls and twenty-three under-examined boys) who were randomly selected from the nursery and preschoolers. In one stage, each child's parents as familiar speakers read two equivalent versions of word/non-word tasks for children to repeat them as well as a male and a female as unfamiliar speakers in the other stage. Stages were performed randomly. Children's correct repetitions were considered correct auditory perception answers. Data were analyzed with SPSS (version 22th). Finally, differences between average auditory perception scores were analyzed by Paired T-test and Four-Way Repeated Measures ANOVA.

Results : There is not significant difference in the average scores of children's auditory perception of words/non-words spoken by familiar and unfamiliar speakers (p>0/07). In the other words, the speaker's role in reading meaningful and meaningless items for preschoolers was not significant in their repetitions.

Conclusion : This finding shows that if the auditory perception task at the word level presented alive to preschool children by various speakers, the role of speaker such as gender and familiarity is not significant.

Keywords : speaker's gender; speaker's familiarity; auditory perception task; Persian speaking children; real words/nonwords

Count: 97
Abstract ID: 21
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Oral

Comparison of the Effect of Four Transcranial Direct Current Stimulation (tDCS) Configurations on Picture-Naming improvement in Non-Fluent Aphasia: A Randomized Clinical Trial

Submission Author: Bahareh Rezaei

Bahareh Rezaei[1], Anahita Khorrami Banaraki[2], Fariba Yadegari[3]

1. 1. Assistant Professor, Department of Speech Therapy, Faculty of Rehabilitation, Hamadan University of Medical sciences, Hamadan. Iran.
2. Institute for Cognitive Science Studies, Tehran, Iran
3. 3. Associated professor, Department of Speech Therapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Background and Aim : : Anomia is a language disorder that reduces communication abilities in people with aphasia (PWA). We aimed to compare the effects of Transcranial Direct Current Stimulation (tDCS) over the left and right inferior frontal gyrus (IFG) and superior temporal gyrus (STG) on the accuracy and reaction time of picture-naming PWA.

Methods : This was a randomized, single-blind, sham-controlled crossover trial. The statistical population comprised PWA, who were referred to Mobasher Khashani clinic in Hamadan, in 2021. The patients received five days of Real-tDCS (1 mA; 20 minutes) and five days of sham-tDCS with a 7-day washout period. The accuracy and reaction time of 50 pictures from the Persian Aphasia Naming Test were assessed in three phases: baseline, real-tDCS, and sham tDCS. The data were analysed using the STATA software, Version 11. A P value of less than 0.05 was considered statistically significant.

Results : Sixteen non-fluent PWA entered this study. 64% of patients were found to benefit from the tDCS over STG, and 18% from the tDCS over IFG. The results of ANOVA analysis showed that there was a significant treatment effect on the accuracy of naming (P=0.003) and Persian Western Aphasia Battery-1(P-WAB-1) score (P=0.01), whereas administering a sham caused no noticeable improvements. Also, there was no significant treatment effect on reaction time (P=0.28).

Conclusion : The results showed that an individualized protocol that contains five sessions of the cathodal or anodal tDCS at the intensity of 1 mA for 20 minutes over STG area can improve naming accuracy in PWA.

Keywords : Transcranial Direct Current stimulation, Aphasia, Anomia, Reaction Time

Count: 98
Abstract ID: 208
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Oral

New approach to control inflammatory processes in acute SCI:Early low-doseLPS enhanced effects of G-CSF and BM-MSC combination therapy,ameliorate pathological changes and enhanced functional recovery

Submission Author: Shiva Hashemizadeh

Shiva Hashemizadeh[1], Mahmoudreza Hadjighassem [2]

1. Brain and Spinal Cord Injury Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran
2. Brain and Spinal Cord Injury Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Finding a therapy for SCI has become a major health concern, despite success in monotherapies such as drug or stem cell engraftment in preclinical studies, but has not yet proven any significant efficacy in clinical trials.Bone-marrow mesenchymal stem cell (BM-MSCs) has not yet proven any significant therapeutic efficacy in spinal cord injury (SCI) clinical trials, due to hostile microenvironment of injured spinal cord at acute phase. Because of the complexity of SCI insult, a strategy combining different approaches provides better outcomes.We designed an investigation to create a permissive environment for cell transplantation at acute phase. Therefore, In the present in vivo study, we examined possible combination therapeutic approaches for spinal cord injury with the use of drug administration, by lipopolysaccharide(LPS) and granulocyte colony stimulating factor (G-CSF) to address early BM-MSC transplantation

Methods : We designed a customized impact device to develop contusion spinal cord injury in rats. First, we determined the optimum injection time and sub-toxic dosage of LPS following T10 contusion injury. Wistar rats, 250-270 g in weight were applied. LPS were intraperitoneally administrated at the low doses 0.2 and 0.5 mg/kg at immediate(2h) and early(6h) time separately.The second aim of our study was applied adjunct treatment of LPS and G-CSF with BM-MSC (1×105 cells) intra-spinal injection to enhance the beneficial effects of early transplanted stem cells to treat the clinically relevant rat spinal cord contusion injury. we evaluated the expression of pro-inflammatory (CD86, IL-1ß, IL-12, NF-kB) and anti-inflammatory (CD206, IL-13, IL-10, C/EBP ß) associated genes by quantitative PCR at different time course up to 28 days. We determine the effectiveness of LPS injection in structural remodeling and behavioral outcome after SCI.Effect of combination therapy assessed by motor functional analysis, western blot

(caspase-3), ELISA (TNF-a, IL-10), and histological analysis (toluidine blue and luxal fat blue staining).

Results : Medium-dose LPS administration may result in a local anti-inflammatory beneficial role, This regulatory role is associated with an increase in NF-200-positive cells,significant tissue sparing, and improvement in functional recovery compared to the SCI control group Our results demonstrated combination therapy increased potency to enhance anti-inflammatory response (IL-10,Arg-1) , decrease inflammatory marker (TNF-a and CD86) and caspase-3 compared to BM-MSC monotherapy. Histological analysis revealed that combination groups displayed better structural remodeling than BM-MSC monotherapy. In addition, BBB score show increase motor recovery in all treatment groups. Moreover, drug therapy shows faster recovery than BM-MSC monotherapy.

Conclusion : Our results suggest that sub-toxic dose of LPS provides neuroprotection to SCI and can promote the beneficial effect of BM-MSC in SCI. These findings suggest that a combination of LPS or LPS+G-CSF prior BM-MSC transplantation is a promising approach for optimizing BM-MSC based strategies to treat SCI.

Keywords : Combination therapy, neuro-inflammation, spinal cord injury, bone marrow mesenchymal stem cell

Count: 99
Abstract ID: 209
subject: Social Neuroscience: Developmental approaches
Presentation Type: Oral

How do early adolescents weigh social information when deciding whether to take risks?

Submission Author: Amir Hossein Tehrani Safa

Amir Hossein Tehrani Safa[1], Atyie Sarabi Jamab[2], Mohammad Herasat [3], Reza Ghaderi[4]

1. Department of Cognitive Modeling, Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
3. Department Psychology, University of Tehran, Tehran, Iran.
4. Department of Cognitive Modeling, Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : Peer influences play a big role in shaping learning and decision preferences during adolescence. Teenagers can use peers as a source of information and change their behavior through peer-to-peer observations, especially in risk-taking behaviors. To examine whether and how adolescents ' risk attitudes, change when they see information about peers' choices, we integrated an economical behavioral task and computational modeling framework.

Methods : We recruited 38 middle school male students aged 12-15 years (median age = 13). The experiment consisted of three sessions: The first session and the third session were designed to evaluate the risk attitude of the participants. In these sessions, called the "self-phase," participants had to choose between accepting and rejecting a gambling offer in each trial. The participants were told that if they chose to reject the offer, they could take a guaranteed amount of money and if they accepted the offer, they would be able to enter the gamble at the end of the game. The gambling money for all the trials was higher than the sure money. In the second session, known as the "prediction phase," participants were asked to predict the choices made by their peers, and then the computer would give them feedback on the correctness of their predictions. Each participant was randomly assigned to risk-taking or risk-averse peers.

Results : Our results showed that young adolescents' risk attitudes increased/decreased when they observed peers making risk-seeking/risk-averse choices. Adolescents who predicted risk-averse peers in session 2, exhibited significant declines in their risk attitudes during session 3 (mean of changes= -0.05, SD=0.09, t=-2.13, p=0.02). On the other hand, participants with risk-seeking peers exhibited a significantly higher level of risk attitudes in session 3 (mean of changes=0.07,

SD=0.07, t=3.72, p=0.001). In terms of risk attitudes, social shifts are strongly correlated with differences between participants and their peers (Pearson correlation, r=0.71, P<0.001). It is possible to represent participants' risk attitudes after observing their peers as a weighted average (w) of their baseline risk attitudes and their peers' risk attitudes. As per the generalized linear regression, "w" is between 0.3 and 0.4 (w = 0 means you don't change, whereas w = 1 means you conform fully to peer behavior).

Conclusion : Here, by combining choice data and computational modeling, we demonstrate that risky behavior is contagious among male adolescents. According to our data, peer-biased risk contagion, a socially motivated and deliberate process, is associated with social distance in teens. There's no causal directionality here, but we could speculate that peer influence goes hand-in-hand with social integration as an adaptive process.

Keywords : adolescent development; social influence; risk attitude; observational learning; conformity

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023　　　　　　**Tehran, Iran**

The Relation Between Theory of Mind and Working Memory in Late Childhood and Early Adolescence

Submission Author: Zahra Soltani

Zahra Soltani[1], Vahid Nejati[2], Khatereh Borhani-Corresponding author[3]

1. Institute for Brain and Cognitive Sciences, Shahid Beheshti University
2. Faculty of Education and Psychology, Shahid Beheshti University
3. Institute for Brain and Cognitive Sciences, Shahid Beheshti University

Background and Aim : Introduction: Studies with preschool children and middle childhood have shown significant links between children's working memory (WM) and cognitive theory of mind (ToM), but not affective ToM. However, there is a major gap in our understanding of the relation between WM and TOM in late childhood and early adolescent This is while late childhood and early adolescence is of great importance for social cognition development and its elements such as ToM. The aim of current study is to gauge the potential relation between working memory and cognitive and affective components of ToM.

Methods : Method: Fifty-one 9 - to 15-year-old (M= 12.18, SD= 2.00) participants completed tasks measuring WM and ToM. They participated in a computational version of N-back test for working memory, and YONI test for cognitive and affective theory of mind. After controlling for no behavioral problem by RUTTER behavioral assessment questionnaire, thirty-eight data were analyzed.

Results : Results: The analyses indicated second order (r= .404, p= .022) and total cognitive (r= .417, p= .018) ToM score of YONI were positively correlated with non-target accuracy of 1-back test. Moreover, results revealed that both cognitive (r= .416, p= .020) and affective (r= .393, p= .029) ToM measures were positively correlated with WM tested by 2-back test.

Conclusion : Conclusion: Our findings showed that there is a significant relation between working memory and cognitive theory of mind among late childhood and early adolescence which is consistent with findings in other developmental periods. In addition, the current study adds to the literature with revealing that WM is also related to affective component of TOM in the adolescence onset.

Keywords : Theory of mind; Working memory; YONI test; N-back test; Cognitive and affective TOM

Count: 101
Abstract ID: 351
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Oral

The relationship between personality traits and perception of facial trustworthiness

Submission Author: Delnia Miri

Delnia Miri [1], Mona Izadi[2], Setareh Mokhtari[3]

1. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
3. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : The judgment of other's trustworthiness plays an important role in social decisions. For example, it could affect decisions regarding business partnerships, close relationships, and even electoral outcomes. A growing body of investigations has shown that the main source for inferring people's trustworthiness is their faces. Although the perception of facial trustworthiness is very efficient, it could be influenced by contextual factors. The aim of this research was to study if a person's personality traits could influence the perception of trustworthiness from other's faces.

Methods : Methods: We recruited 91participants aged between 18 To 35 years for this study. They first answered to the Eysenck Personality Questionnaire (EPQ) and then they completed a task involved judgments of the trustworthiness of different faces. The faces were computer-generated in which the level of trustworthiness was systematically manipulated. Each face was presented for 7000 milliseconds and then participants had to rate the trustworthiness of the faces on a 7point Likert scale. The EPQ consists of the E score, which measures extraversion, the N score is a measure of neuroticism, the Lie (L) scale is used to assess response bias and the P scale, the presence of psychoticism. Individuals with each of the four personality criteria fall into two categories: People who had a higher score in each sub-scale of personality and people who had a lower score in each sub-scale of personality.

Results : the analysis showed that people who had a higher score in extraversion)E) sub-scale of personality, rate face more trustworthiness in comparison to those who lower in this sub-scale, and this difference in rating was significant(p=0.000758), similarly, people who had a higher score in psychoticism(p) sub-scale of personality, rate face more trustworthiness in comparison to those who lower in this sub-scale, but this difference in rating was not significant (p=0.552). However, regarding the N and l sub-scale, people who had a lower score in this sub-scales of personality,

rate face more trustworthiness in comparison to those who higher in this sub-scale, but this difference between the two groups was not significant, for the N sub-scale (p=0.607) and for L sub-scale (p=0.636) . The results of our study show that in terms of E personality criteria, there is a significant difference between the two groups (who had a higher score in each sub-scale of personality and people who had a lower score in each sub-scale of personality) in judging facial trustworthiness. It should be noted that the difference between the two groups of people for other personality criteria (N, P, L) has not been significant, i.e. in these criteria, people who have the mentioned personality traits do not show a difference in the judgment of facial trustworthiness.

Conclusion : The personality traits of the observer could influence the perception of trustworthiness from faces.

Keywords : trustworthiness-facial trustworthiness--personality trait-eysenck personality questionnaire

Count: 102
Abstract ID: 268
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Oral

Empathic Dysfunction in Alexithymia is Related to Altered Visual Processing of Pain Facial Expressions

Submission Author: Soroosh Golbabaei

Soroosh Golbabaei[1], Negar SammakNejad[2], Khatereh Borhani[3]

1. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
3. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : In addition to difficulty identifying and describing emotions, Alexithymia is linked to an empathy deficit. Despite recent studies showing their difficulty recognizing facial expressions, it remains unclear whether the empathic deficiency in Alexithymia is related to different visual processing and gaze patterns. Moreover, it is not known if the problem is restricted to inferring empathy from facial cues or if it extends to other parts of the body as well. Thus, in the present study, we studied the relationship between Alexithymia and visual processing of both facial and non-facial pain-related cues during an empathy-for-pain task.

Methods : Forty participants completed the Toronto Alexithymia Scale (TAS-20) and responded to a well-established version of the empathy-for-pain task, while their eye-movement was recorded using an SMI RED250 eye-tracking. The task consisted of 32 trials, depicting either a painful (someone sitting on a chair, receiving an electrical shock to his/her hand) or a non-painful (someone sitting on a chair without receiving an electrical shock) picture, either in close-up (showing the face) or at a distance (showing the face, upper body, and hand) perspective. AOIs in the close-distance photos were eyes and lips, whereas, in the far-distance photos, the right hand was also added. For each participant, the painful/non-painful ratio was calculated for a number of measures, including average fixation time, time to the first fixation, and first fixation duration. The relationship between alexithymia level, as measured by TAS-20, and each gaze-related measure was investigated using Pearson correlations.

Results : The level of alexithymia was negatively correlated with both cognitive, $r = -.358$, $p = .023$, and affective empathy, $r = -.419$, $p = .001$. With regard to close-up pictures, a higher level of alexithymia was positively correlated with time to first fixation, $r = -.383$, $p = .015$, and revisits, $r = -.395$, $p = .012$, but negatively correlated with average fixation time, $r = .409$, $p = .001$, and first fixation duration, $r = .315$, $p = .049$. However, no significant results were found for the lips (all ps

> .05). Regarding distant pictures, participants with higher alexithymia levels displayed a lower average fixation time, r = .364, p = .021, and longer time to first fixation, r = .389, p = .013, in the eye AIO. In contrast, they showed a higher average fixation time, r = .450, p = .003, and lower time to first fixation, r = .409, p = .009, in the lips. Finally, we found no significant correlation between the degree of alexithymia and extracted measures in hand AOI.

Conclusion : We found that alexithymia is associated with an altered gaze pattern that results in empathic dysfunction. Eye contact is integral to social interactions, but diminished attention to the eyes for pain facial expressions may contribute to empathy dysfunction in alexithymia. Additionally, when non-facial body parts (e.g., hands) emit pain signals, alexithymia does not affect the visual processing of such non-facial body parts.

Keywords : Alexithymia; Empathy; Pain Facial Expression; Visual Processing; Eye-tracking

Count: 103
Abstract ID: 269
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Oral

The Effect of Behavioral Synchrony on Perceived Social Bonding

Submission Author: Fatemeh Ebrahimi

Fatemeh Ebrahimi[1], Dr. Abdol-hossein Vahabie[2], Dr. Khatereh Borhani[3]

1. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Cognitive Systems Laboratory, Control and Intelligent Processing Center of Excellence (CIPCE), School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
3. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : The tendency to synchronize with others in social interactions and its effects on intra and interpersonal aspects have been the subject of many studies. Behavioral synchrony is one of the components of interpersonal synchrony, which can strengthen social bonding, group identity and positive emotions. The present study was designed to investigate the effect behavioral synchrony on several important components of social bonding such as closeness, trust and entitativity.

Methods : To empirically investigate the effect of behavioral synchrony on interpersonal perception of social bonding, 144 participants (Mage= 19.30, SD = 3.41) were randomly assigned to one of the three different experimental conditions. They were engaged in a tapping paradigm in which pairs of individuals tapped with their index finger on a table. Participants in the same sex dyads, were randomly assigned to one of the three conditions (a) tapping in synchrony with an auditory metronome, (b) tapping in synchrony with auditory metronome with 180-degree shift in phase, or (c) tapping with an auditory metronome in an asynchronous way. Following the tapping paradigm social bonding in each pair was measured by asking them to rate closeness, trust and entitativity on a 7-point Likert scale.

Results : The results showed that behavioral synchrony in its both in-phase and anti-phase mode strengthens the closeness ($F(2, 124) = 12.85$, $p < .001$), trust ($F(2 , 124) = 5.59$, $p = .005$), and entitativity ($F(2, 124) = 10.36$, $p < .001$) between individuals. Moreover, the social bonding in in-phase synchrony was not significantly stronger than that in anti-phase synchrony ($p = .831$). But opposite results were observed for the effect of both synchronous modes on social bonding compared to asynchronous mode (all $ps < .001$).

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Conclusion : These results indicated that synchronous movement rhythms – with nearly 0- or 180- degrees phase shift – are important source of information which people use to infer the extent to which individuals are a social unit, trustworthy, or socially close.

Keywords : Behavioral synchrony; Social bonding, Closeness; Trust; Entitativity

Count: 104
Abstract ID: 162
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Oral

The main component of Silybum marianum has antioxidative effect on ethanol damage in rats

Submission Author: Arezoo Jabbari

Arezoo Jabbari[1], Ali Arjmand[2], Nejat Kheiripour[3], Abolfazl Ardjmand[4]

1. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
2. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
3. Institute for Basic Sciences, Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, Iran
4. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran

Background and Aim : Oxidative stress caused by the production of free radicals and the chain reaction of lipid peroxidation, neuronal apoptosis and inflammation occurring after ethanol consumption, results in damage to the brain and other vital organs. Among the most deleterious effects mentioned, is its effect on learning, memory and cognitive functions. Silymarin as the main component of the Silybum marianum, has a variety of effects (e.g., anti-apoptotic, antioxidant, neuroprotective etc.). Considering the social consensus for the use of herbal medicines, and the effective role of silymarin in the processes of apoptosis and antioxidation, in the present research, we investigated the effect of silymarin on biochemical parameters of brain antioxidation/oxidation status following ethanol administration in rat.

Methods : Twenty-eight Wistar male rats were divided into four groups of seven: control (saline, i.p); silymarin (oral silymarin. 200 mg/kg); ethanol (2 g/kg/i.p.); and silymarin + ethanol group [oral silymarin 200 mg/kg + ethanol (2 g/kg)] with treatment regimen within 30 days. The biochemical markers of antioxidation (TAC, SOD, CAT, Thiol) and oxidation (MDA, TOS) in the brain were measured. The Mean±SE were analyzed at the significance level of $P<0.05$.

Results : The level of antioxidant markers were decreased in the ethanol group compared to the control group ($p<0.001$). However, the level of antioxidant markers was increased in the silymarin

+ethanol group compared to the ethanol group (p<0.005). No significant differences were seen between silymarin and control groups in all treatments.

Conclusion : Pretreatment with silymarin before ethanol administration significantly reduced the destructive effects of ethanol on brain.

Keywords : Silymarin, Alcohol, Antioxidation, Brain, Rat

Count: 105
Abstract ID: 30
subject: Special topics: Neuroethics
Presentation Type: Oral

Forty-Eight Classical Moral Dilemmas in Persian Language: A Validation and Cultural Adaptation Study

Submission Author: Sajad Sojoudi

Sajad Sojoudi[1], Azra Jahanitabesh[2], Javad Hatami[3], Julia F. Christensen[4]

1. Master's Student, Department of Cognitive Psychology, Institute for Cognitive Sciences Studies, Tehran, Iran
2. Lecturer, Department of Psychology, University of California, Davis, CA, USA
3. Associate Professor, Department of Psychology, University of Tehran, Tehran, Iran
4. Senior Researcher, Department for Language and Literature, Max-Planck-Institute for Empirical Aesthetics, Frankfurt/M, Germany Corresponding Author

Background and Aim : Moral dilemmas are a useful tool to investigate empirically, which parameters of a given situation modulate participants' moral judgment, and in what way. In an effort to provide moral judgment data from a non-WEIRD culture, we provide the translation and validation of 48 classical moral dilemmas in the Persian language.

Methods : The translated dilemma set was submitted to a validation experiment with N=82 Iranian participants. Data from Iranian participants confirmed the four-factor structure of this dilemma set including Personal Force (Personal, Impersonal), Benefit Recipient (Self, Other), Evitability (Avoidable, Inevitable), and Intentionality (Accidental, Instrumental).

Results : When comparing the moral judgments of Iranian participants to those of Spanish and Italian participants' from previous research with the same dilemma set, differences emerged. Iranian participants' moral judgments were more deontological (i.e., they refrained from harm) than Spanish and Italian participants. Religiosity made participants' moral judgments more deontological, and also dysphoric mood resulted in a more deontological response style.

Conclusion : The study aimed to validate and adapt a moral dilemma set to the Persian language and provide normative moral judgment data from a sample of Iranian participants. Data from Iranian participants' moral judgment confirmed the four-factor structure of the dilemma set that had previously been described for other cultures, including Spanish and Italian samples. The more religious participants were, the more deontological their responses (lower Utilitarian Response Rate). Our inconclusive results regarding the gender variable could be due to the fact that our

sample size was unequal. In the present study, we translated and validated the first moral dilemma set in Persian. Iranian participants' moral judgments were sensitive to Personal Force, Benefit Recipient, Evitability, and Intentionality. Future cross-cultural assessments may include measures of the level of religiosity between cultures.

Keywords : Moral judgment; moral dilemmas; deontology; utilitarianism; trade-off, Iran; Persia

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Fatal cryptococcal meningitis in an immunocompetent patient: A case report

Submission Author: Bahareh Bashardoust

Bahareh Bashardoust[1], Sadegh Khodavaisy[2], Minoosh Shabani Barzegar[3]

1. Department of Medical Parasitology and Mycology, School of Public Health, Tehran University of Medical Sciences, Tehran, 14155-6446, Iran
2. Department of Medical Parasitology and Mycology, School of Public Health, Tehran University of Medical Sciences, Tehran, 14155-6446, Iran
3. Department of Infectious Disease, School of Medicine Loghman Hakim Hospital Shahid Beheshti University of Medical Sciences

Background and Aim : Cryptococcal meningitis (CM) is the most typical and perilous manifestation of cryptococcosis. The CM is caused by members of the Cryptococcus neoformans and Cryptococcus gattii species complexes. This infection generally occurs in immunocompromised individuals, especially HIV-AIDS patients in resource-limited countries, which may cause significant morbidity, mortality, and long-term disability in the host. The most alarming announcement in the occurrence of CM is the increase of this life-threatening infection in immunocompetent individuals, which is now a major threat to public health.

Methods : A 35 years old male patient with no known underlying medical or surgical issues was referred to the emergency department with a prolonged headache. The headache was a sudden onset severe generalized headache with radiation to the neck and appeared approximately within a month before admission. Constant vague pain was described, which did not alleviate with oral painkillers that were accompanied by fever, photophobia, and confusion. The patient's symptoms had a progressive course with further worsening of the pain and the development of partial hearing loss, blurred vision, nausea and vomiting, and loss of consciousness; however, the patient did not experience seizure episodes. In the initial evaluation, the patient was agitated and confused. He was awake but not alert and oriented with a Glasgow coma scale (GCS) of 12. Vital signs assessment demonstrated a blood pressure of 130/80, respiratory rate of 18, heart rate of 80, and a low-grade fever of 37.8. Viral markers including human immunosuppressive virus (HIV) antibodies were negative. A brain computed tomography (CT) scan without contrast and a spiral chest CT scan were administered, and a lumbar puncture was ordered for routine cerebrospinal fluid (CSF) analysis.

Results : Negative staining with India ink of the CSF sample revealed encapsulated budding yeasts and culture was positive. Cryptococcal antigen detection using latex agglutination assay and lateral flow assay in CSF was positive. Direct molecular detection was positive for cryptococcosis by the 21 plex PCR method. Molecular identification was performed on growth colonies by sequencing the internal transcribed spacer region (ITS1-5.8S-ITS2). The final sequence was blasted and compared with the GenBank database and was identified as Cryptococcus neoformans showing 99.5% sequence identity with the ex-type of the species. Based on fungal laboratory findings, a diagnosis of CM was made, and therapy was started using systemic liposomal amphotericin B, and fluconazole.

Conclusion : which was not successful, and the patient expired. This immunocompetent case reveals alarming announcements in the occurrence of CM in immunocompetent individuals.

Keywords : Cryptococcal meningitis, Cryptococcus neoformans, Immunocompetence, Iran

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Count: 107
Abstract ID: 386
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Oral

Cerebral Venous Sinus Thrombosis with intracerebral hemorrhage following COVID-19 AstraZeneca vaccination

Submission Author: Arsh Haj Mohamad Ebrahim Ketabforoush

Arsh Haj Mohamad Ebrahim Ketabforoush[1], Fereshteh Azedi[2], Mohammad Taghi Joghataei[3], Nahid Abbasi Khoshsirat[4]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
3. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
4. Department of Neurology, Clinical Research Development Unit (CRDU) of Shahid Rajaei Hospital, Alborz University of Medical Sciences, Karaj, Iran

Background and Aim : There are few clinical reports of Cerebral venous sinus thrombosis (CVST) as a result of the AstraZeneca vaccine. It has been predictable that 44% of CVST patients have presented with intracerebral hemorrhage(ICH) in a condition named vaccine-induced immune thrombotic thrombocytopenia (VITT). To the best of our knowledge and reviewing previous reports, it is rare to develop CVST with a considerable delay after ICH occurrence.

Methods : Since the ChAdOx1 nCov-19 vaccine (AstraZeneca) presented for immunization against COVID 19, several hypercoagulable states such as CVST have been reported. Several of them described a more rare condition named VITT which mainly the ICH occurs concurrently or secondary to CVST.

Results : This timeline transposed CVST occurrence after ICH without fulfilling the VITT criteria while the patient was on prophylactic UWH, making this case an educational report for all medical staff to consider different manifestations and probabilities of vaccination side effects.

Conclusion : Also it indicates that vaccination may raise the hypercoagulable state even in a condition of post ICH and anaticoaglant prophylaxis, which might be explain by another pathophysiological process except VITT. Hence, future studies can focus on this prothrombotic causalty of vaccins to make the make the vaccines more safer with lower side effects.

Keywords : Oxford-AstraZeneca COVID-19 Vaccine; Cerebral venous sinus thrombosis; Cerebral hemorrhage

Count: 108
Abstract ID: 333
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Oral

Relation between ADHD and COVID-19: A Review to Guide Advancing Clinical Research and Therapy

Submission Author: Samin Davoody

Samin Davoody[1], Stella Goeschl[2], Rozita Davari-Ashtiani[3], Serge Brand[4]

1. Student Research committee, School of medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Medical University of Vienna, Vienna, Austria
3. Child and Adolescent Psychiatry Ward, Imam Hussein Hospital, Shahid Beheshty University of Medical Sciences, Tehran, Iran
4. Center for Affective, Stress and Sleep Disorders (ZASS), University of Basel, 4002 Basel, Switzerland

Background and Aim : To cope with the COVID-19 pandemic, national health authorities temporarily closed cultural, religious, and educational institutions such as universities and schools. Children and adolescents with ADHD were challenged with the restrictions caused by the Covid-19 pandemic such as homeschooling and reduced physical activity. The present narrative review aimed to summarize the state-of-the-art regarding associations between COVID-19-related social restrictions and possible psychological and behavioral issues in children and adolescents with ADHD. Additionally, we discussed the underlying possible reasons of the association focusing on the role of parental influence and physical activity, vulnerabilities of individuals with ADHD to Covid-19 infection and to school closure and remote learning.

Methods : o collect data for the present narrative review, recent publications on these topics between February 1st, 2020 and January 10th, 2021 were retrieved from the most popular search engines (PubMed; Scopus; Google Scholar; Psych Info; Embase) through a comprehensive search using relevant keywords.

Results : During confinement, children and adolescents with ADHD reported increased behavioral and ADHD-related symptoms and overall decreased psychological well-being. Factors negatively impacting children's and adolescents' behavioral symptoms and well-being were: less physical activity, adverse parental behavior, difficulties in coping with preventive guidelines, and school closure and remote learning consequences.

Conclusion : Children and adolescents with ADHD and their caregivers faced both specific and general psychological issues related to the school lockdowns and homeschooling. Additionally, Individuals with ADHD seem to be more vulnerable to Covid-19 infection which highlights the need for better healthcare adaptation.

Keywords : Attention Deficit Disorder with Hyperactivity; COVID-19; Mental Health; Psychiatry; Review.

Count: 109
Abstract ID: 416
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Oral

Mechanisms of COVID-19-induced cerebellitis

Submission Author: Mohammad Banazadeh

Mohammad Banazadeh[1], Sepehr Olangian-Tehrani[2], Melika Sharifi[3], Mohammadreza Malek-Ahmadi[4], Farhad Nikzad[5], Nooria Doozandeh-Nargesi[6], Alireza Mohammadi[7], Gary J. Stephens[8], Mohammad Shabani[9]

1. Pharmaceutical Sciences and Cosmetic Products Research Center, Kerman University of Medical Sciences, Kerman, Iran
2. School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran
4. Faculty of Pharmacy, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
5. Student Research Committee, International Campus, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
6. School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
7. School of Pharmacy, Guilan University of Medical Science, Rasht, Iran
8. School of Pharmacy, University of Reading, Whiteknights, Reading, UK
9. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : The COVID-19 pandemic caused by SARS-CoV2 has raised several important health concerns, not least increased mortality and morbidity. SARS-CoV2 can infect the central nervous system via hematogenous or transneuronal routes, acting through different receptors including ACE2, DPP4, and neuropilin 1 and cause several issues, including the focus here, cerebellitis. The cerebellum is an essential part of the CNS located adjacent to the brainstem with a complex micro and macroscopic structure. The cerebellum plays several physiological roles, such as coordination, cognition, and executive functioning. Damage to the cerebellum can lead to incoordination and ataxia. In our article, we would review the interaction of SARS-CoV2 and the cerebellum and summarize some of the clinical studies about cerebellitis induced by COVID-19.

Methods : In our narrative review, we searched different databases from 2021 to 2022 with the keywords cerebellum and COVID-19; 247 studies were identified and reviewed, focusing on clinical studies and excluding non-clinical studies; 56 studies were finally included for analysis.

Results : SARS-CoV2 infection of the cerebellum can be seen to be assessed through many methods such as MRI, PET, CT, postmortem studies, and histological findings. These methodological studies have demonstrated that cerebellar infection with COVID-19 can bring about several sequelae such as thrombosis, microbleed, hemorrhage, stroke, autoantibody production, ataxia, and widespread inflammation in the cerebellum.

Conclusion : The worldwide COVID-19 pandemic is widely reported to affect vital organs including the respiratory system and some parts of the CNS. Interestingly, MRI, PET, and CT scans of infected people have pointed to cerebellar damage. Taken together, we believe the cerebellum is susceptible to attack from the SARS COV-2 virus, which results in a wide range of neurological symptoms from ataxia to stroke mediated by different damaging mechanisms (e.g. inducing autoimmune reactions, inducing blood clots and hemorrhage, and direct infection of neural and glial cells in the cerebellum). Such central effects are likely to exacerbate the known multiorgan effects of SARS-CoV2 and should also be considered as part of disease prognosis.

Keywords : Cerebellum; COVID-19; SARS-CoV2; ataxia; stroke

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The Contribution of Gut-Brain Axis to Development of Neurological Symptoms in COVID-19 Recovered Patients: A Hypothesis and Review of Literature

Submission Author: Kimia Vakili

Kimia Vakili [1], Mobina Fathi[2], Shirin Yaghoobpoor[3]

1. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : The gut microbiota undergoes significant alterations in response to viral infections, particularly the novel SARS-CoV-2. As impaired gut microbiota can trigger numerous neurological disorders, we suggest that the long-term neurological symptoms of COVID-19 may be related to intestinal microbiota disorders in these patients.

Methods : Thus, we have gathered available information on how the virus can affect the microbiota of gastrointestinal systems, both in the acute and the recovery phase of the disease, and described several mechanisms through which this gut dysbiosis can lead to long-term neurological disorders, such as Guillain-Barre syndrome, chronic fatigue, psychiatric disorders such as depression and anxiety, and even neurodegenerative diseases such as Alzheimer's and Parkinson's disease.

Results : These mechanisms may be mediated by inflammatory cytokines, as well as certain chemicals such as gastrointestinal hormones (e.g., CCK), neurotransmitters (e.g., 5-HT), etc. (e.g., short-chain fatty acids), and the autonomic nervous system. In addition to the direct influences of the virus, repurposed medications used for COVID-19 patients can also play a role in gut dysbiosis.

Conclusion : In conclusion, although there are many dark spots in our current knowledge of the mechanism of COVID-19-related gut-brain axis disturbance, based on available evidence, we can hypothesize that these two phenomena are more than just a coincidence and highly recommend large-scale epidemiologic studies in the future.

Keywords : SARS-CoV-2, COVID-19, Gastrointestinal Microbiome, Gut-Brain axis, Neurological disorders

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Count: 111
Abstract ID: 202
subject: Cognition: Learning and Memory
Presentation Type: Poster

Cross state-dependent memory retrieval between cannabinoid CB1 and serotonergic 5-HT1A receptor agonists in the mouse dorsal hippocampus

Submission Author: Majid JafariSabet

Majid JafariSabet[1], Shiva Amiri [2]

1. Department of Pharmacology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Toxicology and Pharmacology, Faculty of Pharmacy, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Understanding the neurobiological mechanisms of drug-related learning and memory formation may help the treatment of cognitive disorders. Dysfunction of the cannabinoid and serotonergic systems has been demonstrated in learning and memory disorders. The present paper investigates the phenomenon called state-dependent memory (SDM) induced by ACPA (a selective cannabinoid CB1 receptor agonist) and 8-OH-DPAT (a nonselective 5-HT1A receptor agonist) with special focus on the role of the 5-HT1A receptor in the effects of both ACPA and 8-OH-DPAT SDM and cross state-dependent memory retrieval between ACPA and 8-OH-DPAT in a step-down inhibitory avoidance task.

Methods : The dorsal hippocampal CA1 regions of adult male NMRI mice were bilaterally cannulated, and all drugs were microinjected into the intended injection sites. A single-trial step-down inhibitory avoidance task was used to assess memory retrieval and state-dependence.

Results : Post-training and/or pre-test microinjections of ACPA (1 and 2 ng/mouse) and 8-OH-DPAT (0.5 and 1 µg/mouse) dose-dependently induced amnesia. Pre-test administration of the same doses of ACPA and 8-OH-DPAT reversed the post-training ACPA- and 8-OH-DPAT-induced amnesia, respectively. This phenomenon has been named SDM. 8-OH-DPAT (1 µg/mouse) reversed the amnesia induced by ACPA (0.5, 1, and 2 ng/mouse) and induced ACPA SDM. ACPA (2 ng/mouse) reversed the amnesia induced by 8-OH-DPAT (0.25, 0.5, and 1 µg/mouse) and induced 8-OH-DPAT SDM. Pre-test administration of a 5-HT1A receptor antagonist, (S)-WAY 100135 (0.25 and 0.5 µg/mouse), 5 min before ACPA and 8-OH-DPAT dose-dependently inhibited ACPA- and 8-OH-DPAT-induced SDM, respectively.

Conclusion : The present study results demonstrated ACPA- and 8-OH-DPAT- induced SDM. Overall, the data revealed that dorsal hippocampal 5-HT1A receptor mechanisms play a pivotal role in modulating cross state-dependent memory retrieval between ACPA and 8-OH-DPAT.

Keywords : ACPA, 8-OH-DPAT, (S)-WAY 100135, dorsal hippocampus, state-dependent memory

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Intergenerational effects of adolescent morphine exposure on spatial learning and memory

Submission Author: Vida Alipour

Vida Alipour[1], Amir Shojaei[2], Javad Mirnajafi-Zadeh[3], Hossein Azizi[4]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Drug addiction is a worldwide social and medical disorder. More than 50 percent of drug abusers start their substance abuse during adolescence between the ages of 15 and 19. Adolescence is a sensitive and crucial period for the development and maturity of the brain. Chronic exposure to morphine, particularly during this period, can lead to long-lasting effects, including effects that transfer to the future generation. The current study examined the intergenerational effects of paternal morphine exposure during adolescence on spatial 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 spatial memory using Morris water maze. The training trials were conducted over four days, with four daily trials. For each session, the animal was placed in one quadrant of the maze to find the platform for 60 seconds. The interval between trials were 60 seconds. The probe test was performed 24 hours after the last training day while the platform was removed from the quadrant.

Results : It was observed that distance moved, escape latency and swimming speed decreased over four training days, indicating that spatial learning had taken place. Morphine-sired offspring tended to spent significantly more time in the target quadrant in the Morris water maze on probe day when compared to the saline-sired ones.

Conclusion : Paternal exposure to morphine during adolescence improved spatial memory in male offspring.

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

Count: 113
Abstract ID: 250
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effect of azithromycin on hippocampal cells and oxidative stress in male Wistar rats.

Submission Author: Ali Abdoli

Ali Abdoli[1], Dr. Niloufar Darbandi[2], Dr. Majid Komijani [3]

1. Master student of Biology Department, Faculty of Basic Sciences, Arak University
2. Assistant Professor, Department of Biology, Arak University
3. Assistant Professor, Department of Biology, Arak University

Background and Aim : Antibiotics, despite their beneficial effects in preventing the growth of pathogenic bacteria, affect behavioral and memory processes by affecting the amygdala and hippocampus. Recently, researchers found a significant reduction in mature neurons, neural progenitor cells, and neurogenesis in the hippocampus of mice after a course of antibiotic treatment. On the other hand, the use of antibiotics leads to an increase in oxidative stress. The brain is very vulnerable to oxidative stress and the interference of organophosphates with the body's antioxidant system can cause neuropathy and memory impairment. Based on this, the effect of antibiotic azithromycin on hippocampal cells and oxidative stress level in male Wistar rats was investigated in this study.

Methods : In this experimental study, adult male Wistar rats weighing 220 to 250 grams were divided into control and antibiotic groups. In the control group, normal saline (0.6 ml) and in the treatment group with antibiotic azithromycin (15 mg per rat with a volume of 0.6 ml) were gavage daily for 7 days. After the treatment period, the healthy cells were counted in the hippocampal regions of Corneumonis and compared in the experimental groups. Oxidative stress was evaluated by measuring lipid peroxidation (MDA), antioxidant power of whole blood serum (FRAP) and catalase enzyme level (CAT).

Results : Counting the number of healthy neurons in the tissue sections of the group treated with the antibiotic azithromycin in the CA1, CA2 and CA3 regions of the hippocampus showed a significant decrease compared to the control group ($p<0.001$). In this study, in the antibiotic treatment group, the amount of malondialdehyde in the blood serum significantly increased ($p<0.01$), the antioxidant power of the whole blood serum ($p<0.001$) and The amount of catalase enzyme ($p<0.01$) decreased significantly compared to the control group.

Conclusion : According to the present results, it seems that the antibiotic azithromycin leads to a decrease in the number of healthy cells in the hippocampus by causing oxidative stress, and this way it can have a destructive effect on memory and learning.

Keywords : Azithromycin antibiotic, Hippocampus, Oxidative stress, Rat.

Count: 114
Abstract ID: 496
subject: Cognition: Learning and Memory
Presentation Type: Poster

Comparison of executive function and neuropsychological evidence in students with ADHD and normal

Submission Author: اصل امیری Amiriasl

Amiriasl[1] اصل امیری

1. Azad university

Background and Aim : Comparison of executive function and neuropsychological evidence in students with ADHD and normal.

Methods : The compared sample consisted of two groups of 22 people with ADHD and normal people with age, gender, education and marital status variables. The research method has been post-event type and the research data after collecting through Beck anxiety tests, Beck Depression II, and Wisconsin Card Sorting Test were analyzed using descriptive and inferential statistics methods. Were analyzed.

Results : In the measurement of executive function using the Wisconsin test, no difference was seen between generalized and normal anxiety groups.

Conclusion : It seems that in ADHD, the presence of neuropsychological defects leads to poorer performance of these patients than those normal people.

Keywords : executive function, students, ADHD, normal

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February 13-14, 2023   **Tehran, Iran**

Count: 115
Abstract ID: 487
subject: Cognition: Learning and Memory
Presentation Type: Poster

Investigating the relationship between fine motor skills and selective attention in elementary students with specific learning disabilities: the mediating role of executive functions

Submission Author: Alireza Yaghobi

Alireza Yaghobi[1], mehdi yaghobi[2]

1. PayamNoor univercity, Noorabad Delfan branch
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aim of this study is investigating the relationship between fine motor skills and selective attention in elementary students with specific learning disabilities: the mediating role of executive functions

Methods : 256 students were selected by convenience sampling of schools of Delfan. Participants filled out the Wechsler Intelligence Scale (2003), Jiva et al.'s Executive Functions Questionnaire (2002), Lincoln Ezertsky Motor Development Test (1950) and Reading and Dyslexia Test. Then, data were analyzed by using correlation and structural equation modeling tests.

Results : Fine motor skills have a significant effect on the learning of elementary students with learning disabilities both directly and indirectly, that is, through executive functions.

Conclusion : Considering the relationship between fine motor skills and the learning of primary school students and their executive functions, teachers of special learning problems and schools should pay more attention to these issues.

Keywords : Selective attention, specific learning disabilities, executive functions, student

Count: 116
Abstract ID: 154
subject: Cognition: Learning and Memory
Presentation Type: Poster

Vitamin B12 administration prevents ethanol-induced learning and memory impairment through re-establishment of the brain oxidant/antioxidant balance, enhancement of BDNF and suppression of GFAP

Submission Author: Farimah Beheshti

Farimah Beheshti[1], S. Mohammad Ahmadi-Soleimani[2], Elham Akbari[3]

1. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
3. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : There are growing evidence indicating that the adolescent brain is persistently affected by the use of psychostimulant agents. In this regard, alcohol drinking has become rather common among the adolescents in many societies during the last decade. It is currently well known that long-term ethanol exposure deteriorates various cognitive functions such as learning and memory. Mechanistically, these adverse effects have been shown to be mediated by oxidative damage to central nervous system. On the other hand, Vit-B12 is known to improve cognitive performance by suppression of oxidative parameters. Thus, in the present study we aimed to test whether treatment by Vit-B12 could prevent ethanol-induced complications in mice using behavioral and biochemical methods.

Methods : Different groups of male Syrian mice received ethanol, ethanol+Vit-B12, Vit-B12 alone, or saline during adolescence and then learning and memory functions were assessed by Morris water maze (MWM) and Passive Avoidance (PA) tests. Finally, mice were sacrificed for measurement of biochemical factors.

Results : Results indicated that, adolescent ethanol intake impairs learning and memory function through exacerbation of oxidative stress and Vit-B12 treatment improves these complications by re-establishment of oxidant/anti-oxidant balance in CNS. Moreover, we found that Vit-B12 prevents ethanol-induced reduction of BDNF and enhancement of GFAP and acetylcholinesterase (AChE) activity.

Conclusion : In conclusion, it seems that Vit-B12 supplementation could be used as an effective therapeutic strategy to prevent learning and memory defects induced by chronic alcohol intake during adolescence.

Keywords : Ethanol, Adolescence, Vit-B12, Learning, Memory, Oxidative stress

Count: 117
Abstract ID: 150
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effects of Memantine and Donepezil treatment on learning and memory impairment induced by scopolamine in rats

Submission Author: Hassan Parsanasab

Hassan Parsanasab[1], Hamed Ghazvini [2], Hossein Ghalehnoei *[3], Pouria Bahmani Kolour[4]

1. Department of Medical Biotechnology, Molecular and Cell Biology Research Center, Faculty of Advanced Technologist in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. Department of Neuroscience, Faculty of Advanced Technologist in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of Medical Biotechnology, Molecular and Cell Biology Research Center, Faculty of Advanced Technologist in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Department of Medical Biotechnology, Molecular and Cell Biology Research Center, Faculty of Advanced Technologist in Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : The ability of the brain to store, maintain and recall information is referred as the term "memory" . Memory forms the basis of learning by recording information in the brain. Learning is the acquisition of information that leads to behavioral changes. Administration of scopolamine (SCP) as a muscarinic cholinergic receptor antagonist in animals, is a laboratory Method to design suitable models for learning and memory impairment and cognitive impairment in Alzheimer's disease. In this study, we have assessed the effects of administration of two anti-Alzheimer drugs - Memantine (MEM) as an N-methyl-D-aspartate (NMDA) receptor antagonist and Donepezil (DON) as a Cholinesterase inhibitor and - on learning and memory impairment.

Methods : In this study, 40 Wistar male rats with an age range of 10-12 weeks and a weight of 230-270 grams are used. The rats were randomly divided into five groups and each group includes 8 rats, which are subjected to treatments and behavioral tests for 21 consecutive days. The groups include: 1- Control (Saline), 2- SCP (1 mg/kg), 3- DON (3 mg/kg) + SCP, 4- MEM (10 mg/kg) + SCP and 5- DON+MEM (0.5 mg/kg and 5 mg/kg, respectively) + SCP. Analysis indicators of learning and memory includes of Object memory by Novel object recognition (NOR) test and spatial working memory by Y maze test assessed.

Results : The behavioral tests results indicate that DON and MEM at the administered doses significantly improved the Short term memory and the spatial working memory compared to SCP group and The combined administration of MEM and DON had a significant effect on Short term

memory compared to the SCP group, but the combined administration of these two drugs had no significant effect on the spatial working memory compared to the SCP group.

Conclusion : The present study revealed that the administration of anti-Alzheimer drugs- DON and MEM can effectively improve memory and learning disorders induced by SCP. Many studies stated the positive effects of the DON and MEM on memory and learning disorders, which was also shown in this research. However, further studies are required to investigate the impact of these drugs in memory and learning disorders, which may be a potential examination in the therapy of neurodegenerative disease and preventing the occurrence of Alzheimer's disease in the elderly.

Keywords : learning and memory impairment, Alzheimer's disease, Donepezil , Memantine, Scopolamine

Count: 118
Abstract ID: 220
subject: Cognition: Learning and Memory
Presentation Type: Poster

Fasudil attenuates lipopolysaccharide-induced cognitive impairments in the C57BL/6 mouse via exerting anti-inflammation and anti-oxidative effects

Submission Author: Sahra Jalalkamali

Sahra jalalkamali[1], Vida jashn[2], Mohsen qahremani[3], Sevda mahdi poor[4], negin lajvardi[5], Dr javad babaie[6]

1. Sahra jalalkamali
2. Vida jashn
3. Mohsen qahremani
4. Sevda mahdipoor
5. Negin lajvardi
6. Dr javad babaie

Background and Aim : Systemic inflammation during infectious disorders usually accompanies chronic complications including cognitive dysfunction. Neuroinflammation and cognitive deficit are also observed in some debilitating neurological disorders like Parkinson's and Alzheimer's diseases. Fasudil as inhibition of systemic inflammation, has a wide range of pharmacological effects, including as a vasodilator and as an anti-inflammatory, used to influence a variety of cellular functions like anti-oxidative, and protective properties. In presented study, the effect of fasudil in treat of lipopolysaccharide (LPS)-induced cognitive dysfunction, anti-inflammatory and anti-oxidative, was investigated.

Methods : The C57BL/6 mouses (n=24) were assigned to 4 experimental groups, i.e., sham, LPS, sham fasudil (30 mg/kg) and fasudil -treated LPS. LPS intraperitoneal was given (500 µg/kg/day) at hours 0, 24, 48 and 72 and fasudil was administrated by intraperitoneal injections 2 h after LPS injection for 4 days. Mouses in the sham group received normal saline. The learning and memory performance was assessed using Y-maze and Novel object task. In addition to we measurement hippocampal level of malondialdehyde (MDA) and activity of superoxide dismutase (SOD) as oxidative stress markers and hippocampal level of Interleukin 10 (IL-10) as a potent anti-inflammatory cytokine and nuclear factor-kappaB (NF-κB), as a ubiquitous transcription factor that is involved in inflammatory and immune responses.

Results : According to existing evidences, LPS induces a model of oxidative stress and neuroinflammation in rodents with concurrent elevation of inflammatory cytokines. Findings showed that LPS group animals had a lower alternation score in Y-maze task compared sham group and fasudil led to significant increase in alternation score in LPS fasudil group relative LPS injected group. Our results showed a significant drop in discrimination index in LPS group when compared to sham animals and significant increase was in LPS fasudil groups relative to LPS-injected mouses. Hence, fasudil could attenuate spatial recognition, discrimination, and memory deficits. Furthermore, fasudil ameliorated in LPS-injected group lowered hippocampal level of interleukin 10 (IL-10), nuclear factor-kappaB (NF-?B) and malondialdehyde (MDA) and increased activity of superoxide dismutase (SOD) in hippocampal level.

Conclusion : Fasudil alleviated LPS-induced cognitive dysfunctions and neural inflammation attenuation of oxidative stress and appropriate modulation of NF-κB/IL-10 and is associated with its inhibitory effects on inflammasome and oxidative stress pathways and this may be of potential benefit for the primary progressive phenotype of neurodegeneration diseases.

Keywords : Fasudil, Lipopolysaccharide, Inflammation, Oxidative stress, Cognitive dysfunctions

Count: 119
Abstract ID: 307
subject: Cognition: Learning and Memory
Presentation Type: Poster

Subchronic low-level exposure to diazinon affects inhibitory avoidance memory and amyloid precursor proteins expression in the prefrontal cortex of adult rats

Submission Author: Masoomeh Dadkhah

Masoomeh Dadkhah[1], Salva Afshari[2], Mehdi Sarailoo [3], Elham Safarzadeh [4], Medhi Asghari Azar [5], Mehdi Vosooghi Niri [6]

1. Pharmaceutical Sciences Research center, Ardabil University of Medical Sciences, Ardabil, Iran
2. Students Research Committee, Pharmacy School, Ardabil University of Medical Sciences, Ardabil, Iran
3. Students Research Committee, School of Public Health, Ardabil University of Medical Sciences, Ardabil, Iran
4. Department of Microbiology, Parasitology, and Immunology, Ardabil University of Medical Sciences, Ardabil, Iran
5. Deputy of Research & Technology, Ardabil University of Medical Sciences, Ardabil, Iran
6. School of Public Health, Ardabil University of Medical Sciences, Ardabil, Iran

Background and Aim : Chronic low-level exposure to organophosphate (OPs) chemicals in adulthood has been associated with neurobehavioral impairments, psychological symptoms, and learning and memory deficits but the exact underlying mechanisms remains unclear. Furthermore, the amyloid precursor proteins genes expression affected by diazinon. We assessed gene expression changes following chronic dietary low-level exposure to diazinon, an OP pesticide.

Methods : Adult male rats were randomly divided into four experimental groups and orally exposed to diazinon [(2 mg/kg, for short term (5 days) and long-term exposure 5 days a week for 12 weeks)]. After 5 and 12 weeks, anxiety like behaviors, inhibitory avoidance memory (IAM) and amyloid precursor protein (APP) expression in the PFC were examined. IAM was evaluated by shuttle box instrument and the expression of APP, APLP2, and TNF-a mRNA was also assessed by quantitative reverse transcriptase-polymerase chain reaction (RT-PCR). Data were analyzed using SPSS version 23. Two way ANOVA which followed by Tukey's test for multiple comparisons. Data are represented as the mean $\pm$ SEM. P values of $p < 0.05$ were considered statistically significant.

Results : Results of the current study demonstrated the dysfunction of IAM among the rats exposed to DZN for a long- and short-term exposure (P<0.001), while the mRNA expression of

APP was significantly lower among the rats after long exposure. Moreover, short term diazinon exposure did not significantly alter APP expression in the PFC, the main brain region affected by OPs. In contrast, long duration exposure significantly decreases the expression of APP precursors in the PFC ($P<0.05$).

Conclusion : These data indicate that chronic exposure to diazinon in adulthood, below the threshold to inhibit acetylcholinesterase, stimulates amyloid precursor protein degradation, which may underlie in alleviating and memory impairments. Thus, the findings suggest that exposure with diazinon can result in memory deficits, even at low-level administration. Given the major role of APP in the pathogenesis of Alzheimer's disease, alterations in the expression of APP could contribute to dementia.

Keywords : Diazinon; prefrontal cortex; Amyloid precursor proteins; mRNA expression

Count: 120
Abstract ID: 147
subject: Cognition: Learning and Memory
Presentation Type: Poster

Circulating Advanced Glycation End Products in Alzheimer Patients: A Systematic Review and Meta-analysis

Submission Author: Mojtaba Daneshvar

Mojtaba Daneshvar[1], Reza Heidari-Soureshjani[2]

1. Department of cellular and molecular nutrition, school of nutritional science and dietetics, Tehran university of medical sciences, Tehran, Iran
2. 1. Students' Scientific Research Center, Tehran University of Medical sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD), as the most common cause of dementia, has affected millions of people worldwide. Accumulation of amyloid β in neuronal cells is causative event in pathology of AD and induces neuronal death. Previous studies have linked pathological changes of AD to the glycated protein derivatives, also called Advanced glycation end products (AGEs). AGEs and a ubiquitous form Carboxymethyl-lysine (CML) may enhance amyloid β aggregation and formation of senile plaques, in parallel with eliciting oxidative stress and neuronal cell death. Several studies have noted inconsistent findings according to the circulating levels of AGEs in AD patients; Hence, due to the inconsistencies between studies we aimed to summarize current evidence by conducting a systematic review and meta-analysis.

Methods : PubMed, Scopus, Web of Science, Cochrane library, and EBSCO databases were systematically searched using the following keywords (and similar terms) and related MeSH terms: "Advanced Glycation End Products OR methyl-lysine" AND "Alzheimer". To avoid timing bias our searches were restricted to articles published between "2000-2022". Observational studies investigated the association between AGEs (total AGEs or CML concentration) and AD, by comparing sera of cases and controls, were inspected. Subgroup analysis was performed based on measurement method (total AGEs or CML). Random-effect model and Cohen's d statistic were used for pooling data. All analyses were carried out using STATA (StataCorp, Texas, version 14.2), and P value less than 0.05 was considered significant.

Results : Of the 3084 citations, 7 studies found eligible. We entered 7 studies (10 effect sizes) with 468 subjects, including 229 AD cases and 239 control subjects, into the final analysis. By conducting meta-analysis, we found a significant higher serum level of AGEs in patients with AD than in healthy controls (SMD: 1.97; 95% CI: 0.63, 3.30; I2: 96.3%). Stratified analysis also revealed elevated CML levels in AD patients compared to control group (SMD: 0.93; 95% CI:

0.19, 1.67; I2: 80.3%), while the difference was not significant according to the total AGEs concentration (SMD: 3.46; 95% CI: -0.09, 7.01; I2: 98.5%).

Conclusion : This meta-analysis revealed a possible association between AGEs and AD. Our findings also underlined the possible role of AGE axis in progression of AD. Since AGEs and its precursors are mainly produced by animal-based foods, restricting animal sources are suggested to prevent or control AD. Further large-scale studies are needed to confirm the current results.

Keywords : Alzheimer's disease; Advanced Glycation End Products; AGEs; Cognition

Assessing the impacts of Curcumin Niosome on exploratory behavior in Alzheimer's male rats

Submission Author: Mahdi Hamdollahi Dashkasan

Mahdi Hamdollahi Dashkasan[1], Homeira Hatami Nemati[2], Elaheh Asani[3], Somayeh Hatami[4]

1. B.Sc. Student of Molecular and Cellular Biology, Department of Plant and Molecular and Cellular Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Associate Professor of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. M.Sc. Student of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
4. Ph.D. student in Animal Physiology, Department of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is the most common kind of dementia, affecting a significant and growing proportion of the population. The pathophysiological features of AD are increasing the extraneuronal amyloid-beta (Aβ) plaque deposition and intraneuronal aggregation of neurofibrillary tangles made of tau protein, which are considered to be the major causes of this disease. Oxidative stress, which is one main reason for AD, contributes to AD pathophysiology by causing dysfunction of neuronal mitochondria, the oxidation of macromolecules, the generation of ROS by binding metal ions to Aβ plaques, and the upregulation of p-tau and Aβ synthesis. Protein misfolding, stimulation of CNS glia, infiltration of peripheral immune cells, neuronal destruction and death, synapse loss, and neuronal atrophy all contribute to the progression of AD. Various antioxidants have been found to cross the blood-brain barrier and decrease the adverse effects of toxic molecules such as oxygen and nitrogen free radicals in brain cells. Curcumin exerts antioxidant and anti-inflammatory properties in neurotraumatic and neurodegenerative diseases, both by blocking oxidative stress and neuroinflammation, as well as restoring cellular homeostasis and rebalancing redox equilibrium. Thus, it contributes to the improvement of learning and memory impairments. This research aimed to accurately assess how treatments with Curcumin Niosome affected exploratory behavior in an animal model of Alzheimer's disease as measured by the Hole-board test.

Methods : The study was done on 56 male Wistar rats weighing 250±50 gr then were randomly placed in the 7 following groups (n=8): Control, Sham, Alzheimer, Curcumin, Alzheimer + Curcumin, Alzheimer + Curcumin Niosome, Curcumin Niosome. All the test compounds were

injected intraperitoneally. Ethanol (9% v/v) for 14 days as the Sham group, Curcumin (20 mg/kg) for 14 days, Curcumin Niosome (20 mg/kg) for 7 days; and Aluminum chloride was administered at a dose of 2.4 mg/kg, i.p. for 28 days to induce Alzheimer's. The Hole-board test was performed 7 and 14 days after injections to find out the effects of Curcumin and Curcumin Niosome on exploratory behavior in an animal model of Alzheimer's disease. One-way analysis of Variance (ANOVA) and the post hoc Tukey test was used for data analysis ($p < 0.05$ was considered statistically significant).

Results : Obtained data demonstrated that there are no differences between the control group and the Alzheimer's group. The number of head dips is quite reduced in the Alzheimer's disease group compared to the Curcumin Niosome + Alzheimer's group ($p < 0.001$). There is also a significant difference between the Curcumin + Alzheimer's group and Curcumin Niosome + Alzheimer's group ($p < 0.01$).

Conclusion : Persistent oxidative stress and neuroinflammation are critical contributors to the progression of diseases like Alzheimer's. In previous researches, Curcumin has been documented to have potent antioxidant, anti-inflammatory, and anti-apoptotic activities. So the main purpose of this study was to investigate the effects of Curcumin, especially Curcumin loaded Niosome on exploratory behavior. It appears utilizing low doses or relatively short exposure times improves the efficiency of nanocarrier strategies (Niosomes) for drug delivery.

Keywords : Alzheimer's disease; Antioxidant; Curcumin; Niosome; exploratory behavior

Count: 122
Abstract ID: 26
subject: Cognition: Learning and Memory
Presentation Type: Poster

Improvement of memory function through neurofeedback training, fiction or fact?!

Submission Author: Faezeh Rezaei

Faezeh Rezaei[1]

1. Department of Physiology, Faculty of Medicine, Shahed University, Tehran, Iran

Background and Aim : Neurofeedback is a noninvasive neuromodulation procedure in which a feedback of neural activity is provided to the recipient to achieve a desirable level of self-regulation. Recent findings suggest that neurofeedback training results in specific structural and functional changes through the mechanisms of synaptic plasticity as well as activation of certain brain circuits and networks. Many studies have investigated the effects of NFT on different brain functions such as learning, attention and memory in healthy and cognitively challenged subjects providing insights and potential protocols of practice. Understanding the complicated aspects of memory and being able to biologically and clinically affect them is an important achievement for the future of human life. The suggested protocols for improving memory include SMR (sensorimotor rhythm), theta and alpha training. There is also continuous debate over the trainability of brain waves in each individual and longevity of the effects not to mention how and where these effects fit within the clinical setting. While there is enough evidence supporting the beneficial effects of NFT on certain clinical conditions such as attention-deficit/hyperactivity disorder, there is still a lack of data and evidence on the other cognitive, psychological and neurological advantages of the method. However, the intrigue surrounding these subjects is real as well as investigations and speculations which need to be approached by an evidence-based and scientific outlook.

Methods : Several stages were followed to ensure a high quality review of studies and experiments on improving memory function through NFT which include comprehensive search of peer-reviewed journals from all over the world and unbiased summarization of their results and proposed discussions.

Results : According to several studies, SMR and Theta training have improved working memory and the overall cognitive performance in healthy subjects and patients with mildly impaired memory. Alpha training has also shown some promising results and has gained favorable attention in the light of 'personalized medicine'.

Conclusion : Neurofeedback training has shown undeniable potential when it comes to improving memory function in mild to moderate conditions, however, it is not a miraculous phenomenon. It is based upon the most basic of learning mechanisms in brain and would be effective only if applied with a scientific mindset and clinically correct approach.

Keywords : Neurofeedback;Memory;Neuromodulation;cognition

Count: 123
Abstract ID: 17
subject: Cognition: Learning and Memory
Presentation Type: Poster

Small-Scale and Large-Scale Spatial Abilities: Comparison Between Fine and Gross Movement Experts

Submission Author: Narges Shakerian

Narges Shakerian[1], Saeideh Monjezi[2], Mohammad Mehravar[3], Saeed Hesam[4], Mostafa Abdollahi Sarvi[5]

1. 1. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran 2. Department of Physiotherapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran 3. Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
2. 1. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran 2. Department of Physiotherapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
3. 1. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran 2. Department of Physiotherapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
4. 4. Department of Biostatistics and Epidemiology, Faculty of Public Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
5. 5. Student Research Committee, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Spatial ability is one of the core cognitive abilities in individuals which relates to the ability to understand the spatial properties of objects and world events. It is divided into two categories: small-scale spatial abilities and large-scale spatial abilities. Motor learning is one of the factors affecting spatial ability. The present study was designed to investigate and compare the small-scale and large-scale spatial abilities of individuals with fine and gross movement skills.

Methods : A total of 90 individuals between the age of 18 and 45 years, were divided into three 30 groups fine movement experts, gross movement experts, and non-movement experts. Movement experts were included if they followed instrumental music, calligraphy, origami, and sculpturing or table tennis, tennis, squash, and volleyball for 10 years or more regularly. Non-movement experts were selected from the individuals who never followed any manual art performance or sport professionally. All individuals did a battery of small-scale spatial tests with a focus on spatial perception, spatial visualization, and mental rotation including; the three-dimensional shapes test, Revised Purdue Spatial Visualization Test (PSVT: R), Revised Minnesota

Paper Form Board test (R: MPFB), Mental rotation test, and Manikin test. All tests were computer-based and designed by PsychoPy (StandalonePsychoPy-2021.2.3-win64) on a personal laptop device windows 10. In the same session, large-scale spatial abilities consisting of navigation, path integration, and spatial orientation were evaluated by triangle completion test, navigation test (a computer-based game designed in Unity), and Revised Object Perspective (paper pencil version). The final score for each test was calculated based on the original version of each test.

Results : The results of the one-way analysis of variance (ANOVA) showed that in gross movement experts compared to the control group, the total number of questions answered in the three-dimensional shapes test (p-value = 0.017) and the Revised Minnesota Paper Form Board (p-value = 0.047), and the navigation test score (p-value = 0.010) were significantly higher and the distance error in the triangle completion test (p-value = 0.009) was significantly lower. Also, in fine movement experts, the number of correct answers on the three-dimensional shapes test (p-value = 0.003) and Mental rotation (p-value=0.020), and the score of the Revised Purdue Spatial Visualization test (p-value = 0.028) were significantly higher than the control group. In comparison between the two groups of movement experts, the distance error (p-value = 0.007), and turning error to the right direction (p-value = 0.014), in the gross movement experts were significantly lower than fine movement experts.

Conclusion : The results of this study showed better performance of both movement experts in small-scale and large-scale spatial abilities than the control group. In addition, the gross movement experts performed better than the fine movement experts in large-scale spatial ability specifically in path integration. These findings indicated that not only learning gross movement skills improve large-scale spatial abilities but also, they may cause better performance in small-scale spatial abilities.

Keywords : Spatial ability, Small-scale spatial ability, Large-scale spatial ability, Movement experts, Fine movement, Gross movement

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Effect of Afghan Chehelghoza (Pinus gerardiana L.) on Anxiety, Spatial learning, and Memory in Male Rats

Submission Author: Sayed Yousof Mousavi

Sayed Yousof Mousavi[1], Kawsar Alami[2]

1. Neuroscience research center, Kavosh Non-profit Educational-Research Institute, Kabul, Afghanistan
2. Neuroscience research center, Kavosh Non-profit Educational-Research Institute, Kabul, Afghanistan

Background and Aim : There is a close interaction between diet and brain cognitive processes. Studies have shown that nuts as dense energy-rich nutrients, have various constituents, and are effective in learning and memory. Chehelghoza (Pinus gerardiana L.) is a pine nut, which is native to Afghanistan and has multiple biological effects. However, there is not any evidence of its effect on anxiety, memory, and other brain processes. Thus, this study aimed at behavioral evaluation of the effect of chehelghoza combined with diet on spatial learning, memory, and anxiety of male rats.

Methods : In this study, male rats were randomly divided into six groups (the control group, Diazepam as a positive control group for anxiety, and 4 chehelghoza-treated groups). Chehelghoza-treated groups received different amounts of chehelghoza (2, 6, 12, or 25%) combined with their food for 28 days. After the treatment period, the anxiety, spatial learning, and memory of rats were evaluated using behavioral tasks. An Elevated plus maze was used for the evaluation of anxiety, and rats' spatial learning and memory were evaluated by the Morris water maze.

Results : Results showed that Afghan chehelghoza (12 and 25%) could significantly increase the time spent in the target quadrant of rats in the Morris water maze task, compared to the control group (P<0.05). However, there was not a significant difference in escape latency in the morris water maze task between control and chehelghoza-treated groups (P>0.05). In addition, the percentage of time spent in open arms and open arm entries in the elevated plus maze were significantly decreased in chehelghoza-treated (only 25%) and diazepam groups in comparison with the control group (P<0.01).

Conclusion : Overall, a high amount of chehelghoza combined with diet could improve spatial memory, but not learning in rats. Also, high amounts of chehelghoza consumption could alleviate

anxiety in rats and its effect is comparable with the diazepam standard drug. Therefore, consumption of chehelghoza has a significant and valuable effect on brain processes, especially memory and anxiety. It may be considered a potential drug to enhance cognitive functions.

Keywords : Afghanistan; Pinus gerardiana; anxiety; learning; spatial memory; diet

Count: 125
Abstract ID: 144
subject: Cognition: Learning and Memory
Presentation Type: Poster

Gestational folic acid treatment attenuates metabolic and cognitive dysfunctions induced by lithium exposure in rat offspring

Submission Author: Ali Abbaszade cheragheali

Ali Abbaszade cheragheali[1], Farimah Beheshti[2]

1. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
2. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran

Background and Aim : The present study aimed to analyze both neurobehavioral and biochemical results of neonates born of mothers exposed to different doses of lithium and groups that received a high dose of lithium with folic acid

Methods : Male and female rats were mated in separate cages, and pregnant rats were divided into eight first group as a 1) vehicle; 2) received PTU (propylthiouracil) induced hypothyroidism, 3-4) received two different doses of lithium carbonate (15, and 30 mg/kg/day) dissolved in drinking water and 5-7) high dose of lithium (30 mg/kg/day) plus three different doses of folic acid (5, 10, 15 mg/kg/day), 8) received folic acid (15 mg/kg/day). All treatment was allowed to proceed until delivery, and after that, they returned to a regular diet without treatment.

Results : Lithium adisrupts both behavioral (30 mg/kg) and biochemical markers, including TSH, T3, and T4 as measuring indicators to assess thyroid function, IL-10 and TNF-? as anti-inflammatory and inflammatory agents, respectively, malondialdehyde (MDA) as oxidative stress marker, and SOD, Catalase activity as an anti-oxidant indicator. Besides, folic acid, almost at the highest dose (15 mg/kg/day), not only alleviates the negative impact of lithium, but also ameliorates anti-oxidant and anti-inflammatory reagents compared to vehicle when administrated alone

Conclusion : According to the results, prenatal exposure to a high dose of lithium (30 mg/kg) leads to fetal neurodevelopmental disorder and growth restriction through various mechanisms more likely attributed to hypothyroidism which means it should be either prohibited or prescribed cautiously during pregnancy.

Keywords : Lithium; Propylthiouracil; Pregnancy; Oxidative stress; Inflammation.

Count: 126
Abstract ID: 142
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effect of silymarin on inhibitory avoidance memory impaired by ethanol in rat

Submission Author: Arezoo Jabbari

Arezoo Jabbari[1], Ali Arjmand[2], Abolfazl Ardjmand[3]

1. Kashan University of Medical Sciences, Kashan, Iran;
2. Physiology Research Center, Kashan University of Medical Sciences, Kashan, Iran;
3. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran;

Background and Aim : Oxidative stress caused by the production of free radicals and the chain reaction of lipid peroxidation, neuronal apoptosis and inflammation occurring after ethanol consumption, results in damage to the brain and other vital organs. Among the most deleterious effects mentioned, is its effect on learning, memory and cognitive functions. Silymarin as the main component of the Silybum marianum, has a variety of effects (e.g., anti-apoptotic, antioxidant, neuroprotective etc.). Considering the social consensus for the use of herbal medicines, and the effective role of silymarin in the processes of apoptosis and antioxidation, in the present research, we investigated the effect of silymarin on an inhibitory avoidance memory in a rat model.

Methods : Twenty-eight Wistar male rats were divided into four groups of seven: control (saline, i.p); silymarin (oral silymarin. 200 mg/kg); ethanol (2 g/kg/i.p.); and silymarin + ethanol group (oral silymarin 200 mg/kg + ethanol (2 g/kg) with treatment regimen within 30 days. The inhibitory avoidance memory tested in a shuttle box as latency (s) to enter to the dark chamber. Then the locomotor activity of the animals was measured in open field. The Mean±SE were analyzed at the significance level of $P<0.05$.

Results : The latency time in test day was increased in silymarin+ethanol compared to the ethanol group ($P<0.001$). No significant differences were seen between silymarin and control groups in all treatments ($P>0.05$). In addition, no significant differences were seen for locomotion in all groups ($P>0.05$).

Conclusion : The results of the study showed that pretreatment with silymarin before ethanol administration significantly reduced the destructive effects of ethanol and resulted in memory improvement.

Keywords : Silymarin, Alcohol, Learning, Memory, Locomotion, Rat

Count: 127
Abstract ID: 55
subject: Cognition: Learning and Memory
Presentation Type: Poster

The role of Updating working memory in students with learning difficulty in Mathematical Word Problems Solving

Submission Author: Shohreh Roozbahani

Shohreh Roozbahani[1]

1. Hamidreza hassanbadi

Background and Aim : The purpose of this study was evaluating of Updating working memory and Reading comprehension in students with difficulties in Mathematical word Problems Solving (MWP).

Methods : In this study a casual comparative method was used. The participants were 30 students in grade fourth with average performance in Mathematical Word Problem solving (N=15, Normal group) and with Poor performance of problem solving (N=15, Poor group). Performance in mathematical word problem solving by the Iran Key Math, the Intelligence by the Wechsler Intelligence Scale for Children - Fourth Edition (WISC–IV), Reading Comprehension by using a subtest of Wechsler Intelligence, and Updating by a Computer Game (Prof.Nejati, 2013) were evaluated.

Results : The results obtained from this study are consistent with the idea that there is a close relationship between Updating and performance in mathematical word problem solving.

Conclusion : These results indicated that students with poor performance in mathematical word problem solving are also poor updaters and poor comprehenders who have difficulty updating relevant information across different updating tasks. Individual differences such as age, gender, and IQ have important roles that lead to access to these results that could be a concern in future studies.

Keywords : Updating, working memory, Mathematical Word Problems Solving, Reading Comprehension

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February 13-14, 2023   Tehran, Iran

Chronic partial REM sleep deprivation–induced novel object recognition memory impairment: role of the cannabinoid CB1 receptor

Submission Author: Mehdi Khodamoradi

Mehdi Khodamoradi[1], Kaveh Shahveisi[2], Seyedeh Marzeyeh Hadi[3], Nasrin Abdoli[4]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Sleep Disorders Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
3. Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : The cannabinoid CB1 receptor (CB1R) is involved in sleep regulation and memory, especially novel object recognition (NOR) memory. We have previously showed that the CB1R antagonist rimonabant attenuated NOR memory impairment induced by acute rapid eye movement (REM) sleep deprivation (RSD) in male rats. Here, we aimed to investigate whether antagonism of the CB1R could also affect NOR memory in chronically RSD rats.

Methods : Male Wistar rats were examined for NOR memory following a 7–d chronic partial RSD paradigm using the multiple platform technique. The CB1R antagonist rimonabant was administered at the doses of 1 or 3 mg/kg at different time points during the NOR paradigm to evaluate different phases of object recognition.

Results : The RSD episode impaired acquisition, consolidation, and retrieval, but it did not affect the reconsolidation of NOR memory. Administration of the CB1R antagonist rimonabant did not affect acquisition, consolidation, and reconsolidation; however, it attenuated impairment of the retrieval of NOR memory induced by chronic RSD.

Conclusion : Our findings, along with our previous work, may indicate that chronic partial RSD affect NOR memory different than acute RSD. Furthermore, the results demonstrated that the CB1R may, at least in part, be involved in the adverse effects of chronic RSD on the retrieval (but not acquisition, consolidation, and reconsolidation) of NOR memory.

Keywords : REM sleep deprivation; novel object recognition memory; cannabinoid CB1 receptor; rimonabant

Investigating the effect of thiazolidinone synthesized derivative on the passive avoidance learning and expression of caspase-3 in rats

Submission Author: Mohammad Hadi Moradi

Mohammad Hadi Moradi[1], Maryam Taheri[2], Mozhgan Veisi[3], Seyed Ershad Nedaei[4], Hossein Ghafouri[5]

1. Department of Biology, Faculty of Basic Sciences, University of Guilan, Rasht, Iran
2. Department of Biology, Faculty of Basic Sciences, University of Guilan, Rasht, Iran
3. Department of Medical Physiology /Faculty of Medicine, Kermanshah University of Medical Sciences Kermanshah,Iran
4. Department of Medical Physiology /Faculty of Medicine, Kermanshah University of Medical Sciences Kermanshah,Iran
5. Department of Biology, Faculty of Basic Sciences, University of Guilan, Rasht, Iran

Background and Aim : Alzheimer's disease (AD) is the most common age-related neurodegenerative disorder that leads to memory impairment and cognitive impairment. Currently, there are no definite or preventive treatments for most types of dementia. It has been proven that muscarinic anticholinergic drugs, such as scopolamine, cause disturbances in the memory process in humans and animals, and their administration is known as one of the valid animal models for the development of AD. The purpose of this study is to investigate and determine the effect of one of the thiazolidinone derivative to control and treat Alzheimer's rat model.

Methods : In the present study, male wistar rats were used. After the training phase, all injections were done intraperitoneally (saline+buffer, scopolamine (1.5 mg/kg) and thiazolidinone derivative (2 mg/kg)). Finally, after the test phase and memory measurement by passive avoidance learning method, deep anesthesia with chloroform was applied until the animal died. At the end, the desired tissues for western blot analysis were separated from the brains of the animals by performing surgery and after separating the head with a guillotine. The fresh tissue of hippocampus, cerebellum, and cortex was immediately frozen in liquid nitrogen and finally stored at -80 ˚C. A p-value of <0.05 was applied as a significant difference. GraphPad Prism 9 was used to create the graphs

Results : The results of passive avoidance learning showed that the intraperitoneal injection of scopolamine can cause memory destruction on the test day compared to the negative control group,

on the other hand, it was shown that the intraperitoneal injection of synthetic thiazolidinone derivative can improve the memory of rats on the test day compared to the positive control group. The western blot analyze result of the present study showed that the intraperitoneal injection of scopolamine can cause a significant increase in the caspase-3 expression (induce apoptosis and cell death), which compared to the negative control group, indicates the decrease in the performance of brain activities, as well as learning and memory. On the other hand, it was shown that the intraperitoneal injection of the thiazolidinone synthesized derivative caused a significant decrease in the level of expression of caspase-3 compared to the positive control group

Conclusion : Based on these results, thiazolidinone derivative showed a protective apoptosis-inhibition effect on the brain tissues of the AD rats. Also, the synthetic derivative of thiazolidinone showed an effect on improving memory and learning

Keywords : scopolamine; Alzheimer's disease; thiazolidinone derivatives; in vivo; caspase-3; passive avoidance learning

Count: 130
Abstract ID: 401
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effect of agmatine on cognitive and motor deficits in prenatal stress

Submission Author: Amin Hassanshahi raviz

Amin Hassanshahi raviz[1], Mohammad Shabani[2], Mahyar Janahmadi[3], Moazamehosadat Razavinasab[4], Hoda Ranjbar[5], Narges Hosseinmardi[6], Gila Behzadi[7], Kristi A Kohlmeier[8]

1. Neuroscience Research Center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
3. Neuroscience Research Center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
5. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
6. Neuroscience Research Center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
7. Neuroscience Research Center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
8. Department of Drug Design and Pharmacology, Faculty of Health Sciences, University of Copenhagen, Copenhagen, Denmark

Background and Aim : Prenatal stress (PS) results from the mother's experience of stressful events during gestational period , which is associated with an increased risk of cognitive disorders including substance abuse and anxiety in offspring, possibly due to changes in brain development. PS is known to increase dopamine release in the ventral tegmental area (VTA), in part through the effects of corticotropin-releasing hormone. .Agmatine has recently been suggested to play a role in modulating anxiety-like behavior, and we asked whether agmatine can reduce negative cognitive outcomes in rats prenatally exposed to psychological/physical stress and whether this could be mediated by molecular changes in The hippocampus

Methods : The animals were subjected to mental and physical stress and were divided into six groups, which included the control group, the psychological stress group, and the physical stress group. Agmatin was also prescribed in all three groups.

Results : Agmatine reduced the motor activity impairment caused by psychological and physical PS and also decreased STL observed in PS offspring. The level of expression of NMDA subunits in the hippocampus did not change significantly.

Conclusion : Behavioral tests indicate that agmatine exerts a protective effect on PS-induced impairments in memory and locomotor activity .Taken together, our data suggest that prenatal treatment with agmatine exerts protective effect against negative consequences of PS on development of affective circuits in the offspring

Keywords : Agmatine; VTA; Prenatal stress; BDNF

Count: 131
Abstract ID: 466
subject: Cognition: Learning and Memory
Presentation Type: Poster

Quercus infectoria gall extract nanoparticles improves Toxoplasma gondii-induced cognitive deficits: The role of inflammatory markers

Submission Author: Rezvan Sohrabi

Rezvan Sohrabi[1], Mojtaba Khaksarian[2], Hossein Mahmoudvand[3], Marziyeh Rashidipour[4]

1. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Physiology, Lorestan University of Medical Science, Khorramabad, Iran;
3. Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran;
4. Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

Background and Aim : Exposure to Toxoplasma gondii (T. gondii) has been associated with neuroinflammation and cognitive deficits. The present study was designed to examine the putative effects of Quercus infectoria gall extract nanoparticles against T. gondii-induced cognitive deficits and to identify the role of inflammatory markers in a mouse model.

Methods : The mouse model of T. gondii infection was established by the intraperitoneal inoculation of 25–30 tissue cysts from Tehran strain of T. gondii. Administration of Quercus infectoria gall extract nanoparticles (50, 100, and 200 mg/kg; P.O.) was continued for 14 days after confirmation of toxoplasmosis. The cognitive functions of the animals were evaluated by commonly used behavioral paradigms. In addition, the mRNA expression of pro-inflammatory cytokines TNF-α, IFN-ϒ, IL-1β, and iNOS were investigated using real-time PCR in the hippocampus.

Results : The findings of this study showed that T.gondii could impair the learning and memory functions of the animals in both passive-avoidance and water-maze tasks, which was associated with increased the mRNA levels of TNF-α, IFN-ϒ, IL-1β, and iNOS. Interestingly, treatment with Quercus infectoria gall extract nanoparticles improved learning and memory impairments and recovered hippocampal mRNA levels of TNF-α, IFN-ϒ, IL-1β, and iNOS in infected mice.

Conclusion : The results suggest that Quercus infectoria gall extract nanoparticles were able of improving T. gondii-induced cognitive deficits, which might be ascribed, at least partly, to the inhibition of hippocampal inflammatory response.

Keywords : Toxoplasma gondii, Gall of Quercus infectoria, Real-Time PCR, Passive Avoidance test, Morris Water Maze.

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Count: 132
Abstract ID: 484
subject: Cognition: Learning and Memory
Presentation Type: Poster

Evaluation attentional function, emotion regulation and working memory capacity in elementary students with special learning disorders and normal students

Submission Author: Mojtaba Imany

Mojtaba Imany[1], mehdi yaghobi[2]

1. Arak university
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aim of this study was to evaluation attentional function, emotion regulation and working memory capacity in elementary students with special learning disorders and normal students.

Methods : The present study is a Semi-experimental study that was performed on students in Qom. 42 girl students were selected from schools in Qom. Also, were placed in groups, including: experiment group and control group.21 student in experiment group and 21 of them in control group. Participants first completed a demographic information questionnaire. The researcher then performed Spence Children's Anxiety Scale (SCAS), Coolidge Neurological Test and Connors Attention Questionnaire. The data were analyzed using descriptive and inferential methods using SPSS-24 program.

Results : : The results showed that the levels of attentional function, emotional regulation and working memory in primary school students with special learning disorders are significantly lower compared to normal students $(0 / P > 05)$.

Conclusion : According to the results obtained in this research, it is suggested that interventions to strengthen the cognitive and emotional performance of primary school students with special learning disorders should be planned and implemented in schools.

Keywords : attention, emotion regulation, working memory, student.

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The effect of fine motor skills training on self-control and executive actions of children with learning disabilities

Submission Author: Ziv ver Nusrati rod

Ziv ver Nusrati rod[1], mehdi yaghobi[2]

1. Azad university
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aimed of this study was the effect of fine motor skills training on self-control and executive actions of children with learning disabilities.

Methods : The present study was conducted in a quasi-experimental design in 2022. The statistical population of the study included all the students of the third grade of primary school in Neishabur city. 36 people were selected and assigned into control and experimental groups. The experimental group received 8 sessions of movement training and the control group did not receive any regular intervention. Participants in both groups completed the Coolidge's Executive Performance Questionnaire and Tanji's Self-Control Questionnaire on the pre-test, post-test, and follow-up (1 month after the end of the study). Data were analyzed by SPSS software using ANOVA with repeated measures.

Results : Results showed that the mean scores of self-control, and executive actions increased significantly in the experimental group compared to the control group at post-test and follow-up (P <0.001).

Conclusion : Fine motor skills training as a intervention can be one of the effective intervention in school and it can be effective in managing academic problem and improving health.

Keywords : self-control; executive actions; learning disabilities; students

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Count: 134
Abstract ID: 233
subject: Cognition: Learning and Memory
Presentation Type: Poster

Investigation of Long-term effects of repeated exposure to Ketamine during pre-adolescence on neurobehavioral disorders in adult male rats Wistar

Submission Author: Melika Jalali Marnani

Melika Jalali Marnani[1]

1. Melika Jalali Marnani

Background and Aim : Repeated exposure to anesthesia in pre-adolescence is necessary for some therapeutic interventions. Research indicates that exposure to general anesthetics during pre-adolescence can induce cell death, cognitive and behavioral problems, and later neurobehavioral problems in adulthood. Ketamine, an N-Methyl-D-aspartate (NMDA) receptor antagonist, is widely used as a general anesthetic drug. Previous studies have found a link between exposure to general anesthesia in neonatal and childhood and neurobehavioral problems in adulthood later. According to anesthesia studies, repeated exposure to ketamine is associated with social and memory deficits, however, others factors, such as anxiety, also can be important. The current study was aimed at providing morphological and functional evaluations of the long-term impacts of repeated ketamine exposure pre-adolescence and effects of in adulthood in male rat.
Methods : Thirty-two male pre-adolescence rats were randomly divided into four group: control male and female, repeat exposure to ketamine (20mg/kg/ip/daily/14 days) male and female groups. All animals received care for 30-35 days after last injection, then the influence on cognitive functions and social behavior of repeated exposure to ketamine were tested using the fear conditioning, open field, novel object, elevated plus maze and social interaction tests.
Results : Analysis of the elevated plus maze(EPM) data revealed a ketamine-induced anxiety-like profile, corroborated by the open field data. Ketamine treated rats also failed to increase contact time with a conspecific in the social interaction test. Also, a significant difference in total exploration time for each object between the control and ketamine groups.
Conclusion : The widespread use of anesthesia in children and adolescents currently makes its safety a major health issue of interest. Ketamine is the most commonly used anesthetics drug and has gained much attention due to its effects on the central nervous system. Our results indicated that repeated exposure to ketamine during pre-adolescence can cause neurobehavioral problems later in adulthood. These results may provide a new perspective for understanding the mechanism of repeat exposure of ketamine and Ketamine-induced toxic effects in pre-adolescence rats.
Keywords : Ketamine;neurobehavioral;anesthesia;

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Count: 135
Abstract ID: 224
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effect of Methylphenidate on Intracerebroventricular Streptozotocin-Induced Cognitive Deficits in female Rat: A Behavioral Analysis

Submission Author: Zahra Mashhadi

Zahra Mashhadi[1]

1. Zahra Mashhadi

Background and Aim : Methylphenidate (MPH) is a central nervous system (CNS) stimulant commonly prescribed to alleviate the symptoms of attention deficit hyperactivity disorder (ADHD). It primarily blocks the reuptake and increases the cortical levels of dopamine (DA) and norepinephrine (NE), thus defining its efficacy in ADHD. MPH is known in decrease depression, anxiety, and confusion in ADHD patients, also similar symptoms are evident in Alzheimer's disease (AD) patients. For this purpose, in this study, the beneficial effects of MPH were investigated on ICV STZ-induced learning and memory impairment in female rats

Methods : Forty-two female Wistar rats were divided into six groups including: Sham, Sham + MPH (5 mg/kg), Streptozotocin (STZ) (3mg/mg), STZ + MPH (2.5 mg/kg), STZ + MPH (5 mg/kg) and STZ + MPH (10 mg/kg). STZ was induced by a single intracerebroventricular (ICV) and MPH administrated orally once daily for 7 days after bilaterally injected with ICV-STZ. After 2 weeks of ICV-STZ infusion, the learning and memory performance was assessed using passive avoidance paradigm, for spatial cognition evaluation, Morris water maze (MWM) task and for recognition memory novel object task was used.

Results : The behavioral analysis demonstrated significant cognitive decline, memory defects in STZ group animals compared to sham group. However, MPH treatment with 5 and 10 mg/kg significantly decreased latency and distance to move for find of hidden platform in Morris water maze ($p < 0.05$). It was found that MPH-treated STZ-injected rats did not show significant difference on Novel object task compared to STZ-injected rats. In addition, MPH (10 mg/kg) administration significantly attenuated learning and memory impairment in treated STZ-injected group in passive avoidance test.

Conclusion : Present findings suggested the neuroprotective potential of MPH and its effectiveness in preventing learning and memory impairment by ICV STZ in female rats. However, further characterization of its neuroprotective properties of MPH is required to strategize future treatments for several neurological and neurodegenerative disorders, including Alzheimer's disease.

Keywords : Methylphenidate;dopamine;norepinephrine

Count: 136
Abstract ID: 237
subject: Cognition: Working Memory
Presentation Type: Poster

Evaluation of oxidative stress, blood parameters, and neurocognitive status in cement factory workers

Submission Author: Najmeh Sadat Boland Nazar

Najmeh Sadat Boland Nazar[1], Ali Akbar Malekirad[2], Mohammad Abdollahi[3], Kobra Rahzani[4], Mohammad Rezae[5], Marzieh Ahmadi[6], Farhad Torfi[7], Amin Mousavi Khaneghahl[8], Samira Shahrjerdig[9]

1. Physical Medicine and Rehabilitation Department, Imam Khomeini Hospital, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Biology and Psychology, Payame Noor University, Tehran, Iran
3. Toxicology and Diseases Group, The Institute of Pharmaceutical Sciences (TIPS), Tehran, Iran; Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran
4. bDepartment of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran
5. cDepartment of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran; dDepartment of Food Safety and Hygiene, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
6. Department of Biology and Psychology, Payame Noor University, Tehran, Iran
7. Surgical Department,Taleghani Hospital,Shahid Beheshti University of Medical Sciences, Tehran, Iran
8. Department of Food Science, Faculty of Food Engineering, University of Campinas (UNICAMP), Sao Paulo, Brazil
9. Department of Physical Therapy, Faculty of Medical Science, Tarbiat Modares University, Tehran, Iran;

Background and Aim : The current investigation was aimed to evaluate the neurocognitive status such as psychomotor speed, selective attention, Divided attention, Verbal/Nonverbal memory, ,Prospective memory, Spatial functioning and initiative/Energy, blood factors such as LDL,HDL,TG,FBS,ALT,AST and oxidative stress by lipid peroxidation and total antioxidant capacity among cement factory workers who are exposed to dust during their work.

Methods : 82 subjects attended were divided into two groups; the first group included 41 subjects selected from the workers who are working at cement production unit for over five years before the investigation and the second group consist of 41 well-matched employees among the official unit of cement factory with no direct exposure to cement dust.To assess the neurocognitive status, all subjects were interviewed face to face with the aid of experts and using questionnaires includes MHQ,GHQ,SNI and MMSE.Also biochemistry lab and Free radical measurement were done.

Results : The neurocognitive parameters analysis (psychomotor speed (PS), selective attention (SA), divided attention (DA), verbal memory (VM), nonverbal memory (NVM), prospective memory (PM), spatial functioning (SF), and initiative/energy (I/E)) showed that the nonverbal memory impairment subscale was significantly higher in workers in comparison with control group ($p<0.01$) while the other subscales represented no considerable changes.Also there is significant difference in oxidative stress,AST and ALP levels between workers and control group

Conclusion : To protect the health of the workers, dust needs to be removed from the critical area of the factory while the usage of industrial masks is strongly recommended. Cement workers should be subjected to frequent clinical examination

Keywords : Neurocognitive status; oxidative stress;cement

Count: 137
Abstract ID: 378
subject: Cognition: Working Memory
Presentation Type: Poster

The effect of working memory on discourse skills in healthy people

Submission Author: Ehsan Hemmati

Ehsan Hemmati[1], Hossein Hasanpoor[2]

1. Student Research Committee, Iran University of Medical Sciences, Tehran, Iran
2. Think Tank of Cognitive Sciences and Technologies, Research Institute of Logistics, Supreme National Defense University, Tehran, Iran

Background and Aim : The purpose of this research is to investigate the effect of working memory on discourse skills along with the introduction of narrative discourse evaluation indicators. The importance and reason of conducting the present study is that the discourse skill includes cognitive-linguistic links, and conducting this study will greatly contribute to researchers' insight into the effect of working memory on discourse skills.

Methods : This research was a cross-sectional and non-interventional descriptive-analytical study. In this study, 25 students (13 women) from universities of medical sciences in Tehran participated in a non-random, simple, accessible and voluntary way. In this study, Wechsler's "Digit Span" subtest of adult version, 4th edition, was used to evaluate the phonological loop of working memory. n-back task was also used to evaluate the central executive part of working memory. Also, to check the discourse skills, the narrative discourse test of Dr. Ghayoumi and colleagues was taken from each subject individually.

Results : Data analysis showed that there was a direct and significant relationship between the average scores of both working memory tasks and the average scores of sentence complexity, coherence, and cohesion in the discourse test. Also, a negative correlation was observed between the average scores of both working memory tasks and verbal output errors, but it was not significant.

Conclusion : According to the results of this study and the effect of working memory capacity on discourse skills, it seems that it is possible to improve communication and speech skills in people who have developmental or language acquisition disorders, through improving the cognitive capacities of the brain.

Keywords : Discourse Skills, Working memory, Language, Cognition

Count: 138
Abstract ID: 356
subject: Cognition: Working Memory
Presentation Type: Poster

The effect of oxytocin intranasal administration on memory impairment and cognitive function in Alzheimer's like model in male rats

Submission Author: Nahid Sarahian

Nahid Sarahian[1], Abolhassan Ahmadiani[2], Fariba Khodagholi[3], Neda Valian[4]

1. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
4. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background and Aim : Alzheimer's is the most common neurodegenerative disease that gradually affects a person's memory and other mental abilities such as thinking, reasoning and judgment. In this disease, the abnormal accumulation of amyloid beta protein outside and tau protein inside the neurons causes disruption in the function of neurons, the communication of the neuronal network and finally the destruction of neurons. Neuropeptides such as Oxytocin (Oxt) play a role in controlling the survival, proliferation and differentiation of neurons. Therefore, it can be considered as a therapeutic goal to improve behavioral disorders related to Alzheimer's disease .In this study, the effect of intranasal oxytocin administration on working memory and cognitive performance was investigated.

Methods : In this experimental study, animals were divided into 4 groups (Control, Aβ, Oxt and Aβ/Oxt). After anesthesia, hippocampus bi-lateral cannulations were performed, stereotaxically. Two groups of animals (n=8/group) received amyloid-beta (5μg/2.5μl) intra-hippocampally for four consecutive days, and the other two groups received vehicle. After a week recovery, intranasal oxytocin (80μg/20μl) was administered to Oxt and Aβ/Oxt group animals for seven days. The fifteenth day, Y-maze test to measure working memory and Novel object recognition test (NOR) to measure memory impairment and cognitive function were taken. The results analyzed by One-way ANOVA.

Results : Aβ administration reduced working memory and cognitive function significantly (P<0.001). Administration of intranasal oxytocin alone had no significant impact on working memory and cognitive function, compared with the control group. Also, the administration of oxytocin in Aβ group improved memory and cognitive function compared with Aβ group, but this increase was not significant.

Conclusion : Oxytocin may have different effects on attention processes, cognition, and social and emotional memory that are different from its effect on working memory, so it should be considered in future research.

Keywords : Oxytocin, Hippocampus, Memory, cognitive function, Alzheimer's disease

Count: 139
Abstract ID: 449
subject: Cognition: Working Memory
Presentation Type: Poster

The effect of Bilateral repeated transcranial magnetic stimulation (rTMS) on mood and cognition symptoms in individuals with bipolar disorder

Submission Author: Haniyeh Ahmadi Segazi

Haniyeh Ahmadi Segazi[1], Reza Kazemi[2], Reza Rostami[3], Zahra Heydari[4]

1. Department of Psychology, University of Tehran, Tehran, Iran
2. Department of Cognitive Psychology, Institute for Cognitive Science Studies, Blvd Cognitive Science, Pardis, Tehran
3. Department of Psychology, University of Tehran, Tehran, Iran
4. Department of Psychology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background and Aim : Repetitive transcranial magnetic stimulation (rTMS) has been shown to be effective in the treatment of unipolar depression, but studies examining the efficacy of rTMS in bipolar depression are limited. Therefore, the main aim of the present study is to the effectiveness of rTMS and simultaneously on improving mood symptoms and attention and working memory of bipolar disorder

Methods : This research is a clinical trial in the form of a pre-test and post-test method after the intervention. For this, 23 bipolar disorder (type II and mixed) patients were selected from a clinic's client using purposive sampling. In rTMS treatment, during 18 sessions of 30 minutes, a frequency of 1 Hz was applied to the right dorsolateral prefrontal cortex (DLPFC) and a frequency of 10 Hz was applied to the left DLPFC of subjects with an intensity of 120% of the active motor threshold (AMT). To evaluate the attention and memory functions and mood symptoms of the participants, the BDRS questionnaire and Cambridge Neuropsychological Test Automatic Battery (CANTAB) were used.

Results : The total score of the BDRS questionnaire is a significant difference. In this way, the scores of the components of the BDRS questionnaire from the stage pre-test to the post-test stage have decreased significantly. And attention and working memory, the rTMS group improved in the subscales of total missing ($p < 0.05$), mean delay to correct ($p < 0.001$), and mean delay to first choice ($p < 0.05$).

Conclusion : The results of the current study showed that bilateral rTMS can improve mood symptoms and attention in individuals with bipolar disorder.

Keywords : Bipolar Disorder, Attention, Working Memory, rTMS

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Count: 140
Abstract ID: 442
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The effect of cognitive and motor training on reasoning, and psychological well-being of the elite wrestlers

Submission Author: Zeinab Hosini korani

Zeinab Hosini korani[1], Narges papi[2], Fereshteh amouzadeh[3], Zeinab hoseini korani[4], Fatemeh asadi kooh bad[5], Alireza Bahrami[6]

1. -
2. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
3. Ph.D. in sport Psychology, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Tehran, Tehran, Iran,
4. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
5. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
6. Assistant professor, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Arak, Arak, Iran,

Background and Aim : Psychologists believe that psychological well-being is an important factor in the sports success of athletes, including elite wrestlers. Therefore, elite wrestlers and their coaches should be familiar with the practical concepts and methods of acquiring psychological well-being in order to improve their performance and achieve more success. The aim of this study was to investigate the effect of cognitive and motor training on the reasoning and psychological well-being of elite wrestlers.

Methods : 80 elite wrestlers, 16-22 years old with an average age (18.32 ± 2.13 years) voluntarily participated in the present study and were randomly divided into four groups: cognitive training, motor training, combined, and control groups (n=20). The cognitive training and motor training groups performed the interventions for 10 weeks, 3 sessions per week, and 45 minutes. The control group did not receive any intervention. reasoning and psychological well-being were evaluated using Kaplan's neuropsychological test and psychological well-being questionnaire, respectively. Statistical analysis was performed using SPSS version 21 software ($p < 0.05$).

Results : The results of the statistical analysis after the interventions indicated a significant improvement in reasoning (p=0.007), and psychological well-being (p=0.011) in the groups of cognitive training and motor and combined training compared to the control. Also, the combined

group improved reasoning, and psychological well-being more significantly than the cognitive and motor groups.

Conclusion : According to the obtained results, cognitive and motor training have a positive and significant effect on the reasoning and psychological well-being of elite wrestlers. Therefore, it is suggested to use this method to improve the reasoning and psychological well-being of elite wrestlers.

Keywords : PTSD, depression, Injured athletes.

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Count: 142
Abstract ID: 155
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Prenatal morphine exposure alters the electrophysiological properties of locus coeruleus neurons in rats

Submission Author: Elham Alaaee

Elham Alaaee[1], Hossein Azizi[2], Saeed Semnanian[3]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Opioid abuse during pregnancy may have noteworthy effects on the child's behavioral, emotional and cognitive development. In this study, we evaluated the effect of prenatal exposure to morphine on electrophysiological properties of locus coeruleus (LC) as a noradrenergic nucleus involved in cognitive performances.

Methods : Pregnant dams were randomly divided into two groups; prenatal saline and prenatal morphine. On gestational days 11–18, morphine was administered)10 mg/kg, twice daily, s.c.) in prenatal morphine rats. Prenatal saline rats also received saline according to same protocol. Whole cell patch clamp recordings were conducted on LC neurons of male offspring.

Results : The duration of action potentials increased in prenatal morphine compared to the saline ones. Also, the slope decay phase of action potentials, afterhyperpolarization potential amplitude, first spike latency and rheobase current were significantly decreased in LC neurons following prenatal exposure to morphine.

Conclusion : The current findings have shown prenatal exposure morphine possibly altered the functional activity of K+ channels in LC which is implicated in various cognitive functions. Moreover, it is possible that altered electrophysiological properties leads to cognitive impairment fowling the prenatal exposure to morphine.

Keywords : Prenatal exposure, Morphine, Locus coeruleus, Electrophysiology, Cognition

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Long term effects of adolescent morphine exposure on anxiety phenotype in animal model

Submission Author: Fatemeh Khani

Fatemeh Khani[1], Hossein Azizi[2], Ali Pourmotabbed[3], Narges Hosseinmardi[4], Yaghoub Fathollahi[5]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Physiology, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : One of the major perturbations for community health is the arbitrary consumption of drugs and abuse of prescription opiates, especially in adolescents. Chronic opioid exposure, may have lasting effects on emotional behaviors that persist into adulthood. The current experiments were therefore designed to study the effects of sustained opioid exposure during adolescence on negative emotional profiles.

Methods : Adolescent male Wistar rats underwent increasing doses of morphine for ten days (PNDs 31-40). On day 1, rats were injected 2.5 mg/kg morphine sulfate subcutaneously (s.c.) twice daily (8:00 a.m. and 5:00 p.m.). On each subsequent day, the dose of morphine was escalated by 2.5 mg/kg till the day 10 in which animals received the dose of 25 mg/kg. After that, the open field test (OFT) and elevated plus maze (EPM) test were performed over a four-week post-morphine treatment from adolescence to adulthood. Moreover, the weight of the animals was measured at these time points.

Results : We found that chronic adolescent morphine exposure reduces the weight gain during the period of morphine treatment and four weeks after that. It had no significant effect on the motor activity in the animals. Moreover, anxiolytic-like behavior was observed in the rats exposed to morphine during adolescence evaluated by OFT and EPM test.

Conclusion : : Long-term exposure to morphine during adolescence has the profound potential of altering the anxiety-like behavior profile in the period from adolescence to adulthood. The maturation of the nervous system can be impressed by drug abuse during the developmental window of adolescence and these effects may lead to behaviorally stable alterations.

Keywords : adolescence, anxiety, morphine, emotional behaviors, cognitive development

Count: 144
Abstract ID: 146
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Risk Factors Affecting Dementia in Iranian Elderly Women and Predicting the Future Status: A Review Article

Submission Author: Roya Ghandali

Roya Ghandali[1], Zahra Saeedvahed[2]

1. Cognitive psychologist and researcher of Yaadmaan Institute for Brain, Cognition and Memory Studies (IBCMS), Tehran, Iran
2. Cognitive rehabilitation and psychologist, Researcher of Yaadmaan Institute for Brain, Cognition and Memory Studies (IBCMS), Tehran, Iran

Background and Aim : Cognitive problems and dementia are becoming more common in Iran and around the world. According to many research, women are more vulnerable to this disease and its complications than males. According to many research, women are more vulnerable to this disease and its complications than males. The purpose of this study is to look into the elements that influence dementia in Iranian old women, predict the disease's increase rate in the approaching years, and look into strategies and preventive measures.

Methods : More than 32 investigations, 9 publications focused on the factors impacting the prevalence of dementia in the senior population were analyzed in this review study, which was conducted utilizing the databases of Medlib, Magiran, Irandoc, Iranmedex, and SID till May 20, 2022.

Results : Content analysis approaches (1 article), review study (4 articles), connection point regression model (1 article), logistic regression (1 article), retrospective cohort study (1 article), and study (1 article) were included in this review. They were tested using a cross-section (1 article). Obesity, sedentary lifestyle, depression, mental disorders, smoking, alcohol consumption, cardiovascular disease, stroke, hypertension, diabetes, hyperlipidemia, dyslipidemia, high-calorie diet, poor diet, and poor economic status were all investigated in these research. In the incidence of dementia in the elderly, social factors have been identified as effective factors. Mortality from dementia, especially Alzheimer's, has a high rate among Middle Eastern countries. This estimate is based on the latest studies of the World Health Organization in 2020 and reflects the fact that different types of dementia in these countries also account for a percentage of the total burden of disease.

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Conclusion : Based on the findings and due to the growth of Iran's population during the years 1966 to 2016, it can be concluded that little research has been done in Iran on the factors that influence dementia. Demographic variables such as loneliness of elderly women owing to divorce, death of husband, migration of children and their determined celibacy, as well as giving women with fewer educational possibilities than males, are all risk factors for dementia in women. According to the age pyramid of the Iranian population in 2016, the growth of the female population is almost equal to the growth of the male population. the number of Iranian women graduating in different university courses is less than Iranian men, which means that women have fewer educational opportunities than men. While education is one of the factors affecting cognitive abilities and can help the development of cognitive abilities in women. According to studies and future forecasts, it is vital to pay attention to lifestyle modifications that favor nutrition, as well as daily motor activities, new learning, and computer game use, all of which affect cognition, attention, and memory. However, there are other essential elements that play a significant role in dementia prevention. Even if genetically or underlying disorders are in the dementia group, social communication, cordial contacts, constructive family ties, and strong, conscious marriage attachments can decrease the development of age-related cognitive impairments

Keywords : Dementia ; Elderly Women ; Risk Factors; Aging

Count: 145
Abstract ID: 178
subject: Cognition: Cognitive Aging
Presentation Type: Poster

The Effects of Exercise Training with Ursolic Acid Supplementation on Nrf2/Keap1/ARE Signaling Pathway in Hippocampal Tissues in Aged Diabetic Rats

Submission Author: Safoura Alizade

Safoura Alizade[1], Mohammad Faramarzi[2], Ebrahim Banitalebi [3]

1. Department of Sport Sciences, Shahrekord University, Shahrekord, Iran
2. Department of Exercise Physiology, Faculty of Sport Sciences, University of Isfahan, Isfahan, Iran
3. Department of Sport Sciences, Shahrekord University, Shahrekord, Iran

Background and Aim : The rise in age-related cognitive impairment (CIs) and diabetes mellitus is a global health concern. Exercise training has been reported to activate the Nrf2/Keap1/ARE signaling and enhance the antioxidant defense pathways in some animal models. This study aimed to investigate the effects of ursolic acid (UA) associated with resistance or endurance exercise training on antioxidant markers, and the Nrf2/Keap1/ARE pathway in the brain of older diabetic rats.

Methods : 23-month-aged male Wistar rats (427±44 g) were randomly assigned to seven groups (n=8).T2D was induced by HFD/low-dose STZ. The rats received HFD (55%, 31%, and 14% of energy from fat, carbohydrate, and protein, respectively; 5.2 kcal/g). The diets continued for eight weeks for both groups. Over week four, the rats in the group with HFD/STZ-induced T2D received treatment with low-dose STZ. UA supplementation (250 mg/kg, daily) were administered along with resistance (60% maximum capacity of voluntary carrying [MVCC], 14-20 climbs), or endurance training (60-75% velocity at maximal oxygen uptake [vVO2max]), five days/week for eight weeks. Cognitive-motor functioning was assessed through open-field and passive avoidance response tests. Nrf2, Keap1 and antioxidant markers including SOD, CAT, GPx, and GSH were measured by western blot method in the hippocampus tissue.

Results : The results showed a positive effect of endurance (p=0.003) and resistance training (p=0.003) without interaction effect UA and exercise on Nrf2. There was training main effect (p=0.019) without supplementation (p=0.216) or interaction effect (p=0.259) effects on Keap1 concentration. SOD revealed a significant training by supplementation interaction effect (p=0.009); however, there was no main training or UA supplementation effects on CAT, GPx, and GSH. Despite improving spatial memory changes in exercise or UA groups.

Conclusion : It seems that despite some improvements in blood glucose, MVCC, antioxidant markers, and Nrf2, the results demonstrated no significant effects on cognitive-motor dysfunction tests. Thus, further studies are needed to develop novel practical nutritional strategies involving UA supplementation to clarify how chronic UA supplementation with exercise training can be recruited to treat hippocampal complications and cognitive-motor dysfunction caused by diabetes.

Keywords : diabetes, exercise, Nrf2/Keap1/ARE signaling, ursolic acid, cognitive impairment,hippocampus

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Count: 146
Abstract ID: 11
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Adaptation of the clinical guideline on prevention of mild cognitive impairment in hospitalized older adults

Submission Author: Hooman Mohammad talebi

Hooman Mohammad talebi[1], Nasrollah Alimohammadi[2], Mahrokh Keshvari[3]

1. faculty of nursing and midwifery, Medical university of Isfahan, Isfahan, Iran
2. faculty of nursing and midwifery, Medical university of Isfahan, Isfahan, Iran
3. faculty of nursing and midwifery, Medical university of Isfahan, Isfahan, Iran

Background and Aim : Mild cognitive impairment is one of the most common disorders among hospitalized older adults. Prevention of this disorder can increase the quality of life and improve the health of the elderly. Having an integrated, evidence-based clinical guideline can provide a scientific and accurate way to prevent this disorder. Therefore, the aim of this study was to localize the clinical guideline for the prevention of mild cognitive impairment in hospitalized elderly

Methods : This study was conducted based on ADAPTE localization method. Initially, the need for this study was investigated and the research team was identified. The end users and people who will benefit from this guide were then identified. Then, by searching and reviewing the texts, the care needs of the hospitalized older adults were examined. After determining the needs, the databases were reviewed accurately and systematically to find clinical guides, articles and related books. Searching phase was conducted in January 2021 and was updated in April 2021. Two clinical guidelines were found, which due to the limited number of clinical guidelines found, it was not necessary to perform the AGREE step, but for more assurance, the experts reviewed and approved the guidelines by the AGREE II tool. Then, in the Delphi stage, using the mentioned clinical guidelines, articles and books, a draft clinical guideline was compiled, and after reviewing the draft by users and expert panel and scoring the recommendations by the five-point Likert method and making the corrections, the final version of this clinical guideline was developed.

Results : Recommendations from 2 clinical guidelines, 13 articles, and 1 books were included in the five areas of elderly-friendly care introduced by the Canadian Regional Geriatrics Program, including care and treatment, ethics, physical space, emotional-behavioral, and government support. treatment recommendations included subcategories of physical activity, nutrition, tobacco and alcohol, cognitive interventions, medication, and general recommendations.

Conclusion : Localization of clinical guidelines for the prevention of mild cognitive impairment in the elderly hospitalized was performed using clinical guidelines, books and articles found.

Keywords : older adults, Hospitalized, Mild Cognitive Impairment

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Count: 147
Abstract ID: 22
subject: Cognition: Cognitive Aging
Presentation Type: Poster

The role of GPR30 on the spatial learning and memory at different ages: the role of BDNF

Submission Author: Mohadeseh Chahkandi

Mohadeseh Chahkandi[1], Somayeh Vazifekhah[2], Sedigheh Amiresmaili[3]

1. 1. Cellular and Molecular Research Center, Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran
2. 2. Cellular and Molecular Research Center and Department of physiology, Iran University of Medical Sciences Tehran. Iran
3. 3. Department of Physiology, Bam University of Medical Sciences, Bam, Iran

Background and Aim : Evidences suggest that hormone replacement therapy (HRT) is associated with beneficial effects on cognition, and age-related brain diseases. Estradiol, as the main ovarian hormone, exerts its effects on cognitive performance via specific receptors. There is little knowledge regarding the effects of the membrane receptor of estradiol on spatial learning and memory. This study evaluated the role of GPR0(G-protein membrane receptor 30) on the spatial learning and memory of young and old female rats

Methods : . young (non-ovarian (OVX)) (5-7 months) and old (22-24 months) female rats received an intraperitoneal injection (i.p) of E2, G1(receptor agonist) and G15(receptor antagonist) (every 4 day), for 28 days. 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 : Spatial learning and memory in the MWM test were impaired in old rats compared to young OVX rats. it was suggested that young female rats had higher sensitivity to E2 and G1 therapy than old female animals. Therefore, the response to E2 in pre-menopause conditions is different from post-menopause. We observed age-related differences in the effects of E2 and G1 on the BDNF.

Conclusion : Spatial learning and memory in the MWM test were impaired in old rats compared to young OVX rats. it was suggested that young female rats had higher sensitivity to E2 and G1 therapy than old female animals. Therefore, the response to E2 in pre-menopause conditions is different from post-menopause. We observed age-related differences in the effects of E2 and G1 on the BDNF.

Keywords : GPR30, Cognition, BDNF

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Aging Decreases the Precision of Visual Working Memory

Submission Author: Shahrzad Mohammadpour Esfahan

Shahrzad Mohammadpour Esfahan[1], Mehdi Sanayei[2], Ehsan Rezayat [3]

1. Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
3. Department of Psychology, Psychology and Educational Science Faculty, University of Tehran, Tehran, Iran; School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

Background and Aim : Working memory is a cognitive system that temporarily holds information.

Methods : In the current study, we investigated the effect of age on visual working memory, considering the possible sources of errors. A face-based visual working memory task was conducted on 102 healthy individuals aged 18 to 71 and their performance was measured on an analog scale.

Results : We found that the resolution which the visual information is recalled declines with age. This decline is monotonous without any particular age at which a significant drop-off occurs.

Conclusion : We showed that working memory performance decreases with age.

Keywords : Aging, working memory, delayed reproduction task, continuous error

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Trehalose attenuates learning and memory impairments in aged rats via overexpression of miR-181c

Submission Author: Bentolhoda Shafiei

Bentolhoda Shafiei[1], Mahdieh Nazari-Robati [2], Mohammad Shabani [3], ali afgar[4], Mohammad Amin Rajizadeh[5]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
2. Department of Clinical Biochemistry, Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran
3. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
4. Research Center for Hydatid Disease in Iran, Kerman University of Medical Sciences, Kerman, Iran
5. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : MiR-181c is one of the critical regulators of learning and memory ability which is involved in the brain aging process. Trehalose, a natural disaccharide, displays protective effects against neuronal impairment through several mechanisms. However, little is known about the interactive effects of aging and trehalose on behavioral function and underlying miR-181c expression pattern in the hippocampus of young and old rats.

Methods : Male Wistar rats were divided into four groups. Two groups of aged (24 months) and young (4 months) rats were administered 2% trehalose solution for 30 days. Two other groups of aged and young rats received regular tap water. At the end of treatment, rats were assessed for cognitive behavior using the Morris water maze test. The expression level of miR-181c was also measured by qRT-PCR.

Results : We found that trehalose treatment reduced learning and memory impairment in old rats compared to control old animals ($p<0.05$). We also showed that the expression level of miR-181c was significantly increased in trehalose-treated rats ($p<0.01$).

Conclusion : In conclusion, our results indicated that trehalose improved learning and memory function in aged rats by targeting miR-181c thus it may provide a therapeutic strategy to ameliorate age-associated cognitive impairment.

Keywords : Aging, Cognitive function, miR-181c, Trehalose

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Evaluation of the effectiveness of cognitive rehabilitation therapy on executive function and attention in fourth grade primary school children with learning disorder

Submission Author: Azam Ghasemi

Azam Ghasemi[1]

1. Azad university. TorbatJam Branch

Background and Aim : The aim of this study was to evaluate the effectiveness of cognitive rehabilitation therapy on executive function and attention in fourth grade primary school children with learning Disorder.

Methods : The present study is a descriptive-analytical study that was performed on fourth grade students in Mashhad with learning disabilities. After referring to a psychiatrist or clinical psychologist for initial diagnosis of math learning disability based on DSM-5, sampling was performed and Wexler test normative intelligence scores were examined in the academic record. Using simple random sampling method, 15 fourth grade female students with math learning problems were selected from 4 government centers for learning disabilities in Mashhad. Also, in terms of age and sex, 15 normal children were the same. Families first completed a demographic information questionnaire. The researcher then performed version A of the Children's Daily Attention Test at standard time in a quiet, well-lit area for students. Accordingly, two groups with math learning disabilities and healthy counterparts were compared in three areas of continuous attention, selective, control, and attention transfer.

Results : The results show that the distribution of values of all variables except the dual task of sky search (stable attention) and the speed of counting organisms (attention transfer) in the group with learning disabilities has a natural distribution ($P > 0.05$) selective attention ($0 / P > 05$) executive function ($0 / P > 05$) shows a significant difference between the two groups.

Conclusion : The results show that children with learning disabilities perform much worse than healthy counterparts in all three areas. Findings show that the cognitive rehabilitation therapy for children has the ability to detect attention deficits in learning compared to healthy counterparts. Therefore, it can be a good tool for evaluation in this group.

Keywords : attention, Student, school, learning Disorder, executive function

Count: 151
Abstract ID: 475
subject: Cognition: Attention
Presentation Type: Poster

INVESTIGATING THE RELATIONSHIP BETWEEN COGNITIVE FLEXIBILITY AND CREATIVITY WITH ACHIEVEMENT IN ELEMENTRY STUDENTS OF MASHHAD

Submission Author: Azam Ghasemi

Azam Ghasemi[1]

1. Azad university. TorbatJam Branch

Background and Aim : The aim of this study was to Investigating the relationship between cognitive flexibility and creativity and achievement in elementary students of mashhad.

Methods : 256 students were selected by convenience sampling of elementary school. Participants filled out the Torrance creativity questionnaire, Dennis and Vandoral cognitive flexibility questionnaire. Then, data were analyzed by using correlation and structural equation modeling tests.

Results : Findings indicated that there is a significant correlation between cognitive flexibility and creativity with achievement, significantly (P <0.05).

Conclusion : cognitive flexibility and creativity had a significant correlation with achievement.

Keywords : cognitive flexibility, creativity, achievement, student.

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Count: 152
Abstract ID: 391
subject: Cognition: Attention
Presentation Type: Poster

Investigating the effect of anodic tDCS on the expression of NR1 and NR2 proteins and the performance of sustained attention in patients with multiple sclerosis

Submission Author: Mehdi Jahani

Mehdi Jahani[1], Mohammad Nasehi[2], Mehdi Tehrani-doost[3], Mohammad Hosein Harirchian[4], Mohammad Reza zarindast[5]

1. PhD in Cognitive Neuroscience

Background and Aim : Multiple sclerosis (MS) is a demyelinating inflammatory condition of the central nervous system that is often considered an autoimmune disorder. These patients are involved in extensive cognitive defects such as poor attention and concentration, memory and processing speed; therefore, the present study was conducted with the aim of investigating the effect of anodic direct cortical electrical stimulation (tDCS) on the performance of sustained attention in patients with MS in the form of a pre-test-post-test method design with a control group.

Methods : For this purpose, 32 patients with MS disease were selected and randomly assigned to two experimental and control groups using available sampling method. The intervention consisted of 10 sessions of direct electrical stimulation during which the patients were divided into two groups, one group received real stimulation and the other group received sham or sham stimulation. The research tools were the reaction speed sub-tests (RTI) and the rapid visual information processing (RVP) test in the Cambridge University Neurological Functions Test (CANTAB) and the western blotting test. Data analysis was performed based on repeated measurement tests, correlated t and independent t to compare the pre-test and post-test scores in the experimental and control groups.

Results : The results showed an improvement in sustained attention and processing speed and an increase in the expression of NR1 and NR2 genes in the experimental group at a significance level of 0.05.

Conclusion : Therefore, we conclude that transcranial electrical stimulation of the brain leads to the improvement of persistent attention deficits and reaction speed and increases the expression of NR1 and NR2 genes in patients with MS.

Keywords : tDCS, NR1 and NR2 proteins, sustained attention, multiple sclerosis

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Count: 153
Abstract ID: 4
subject: Cognition: Attention
Presentation Type: Poster

The effectiveness of virtual reality-based mindfulness on improving attention control in students with specific learning disorder

Submission Author: Akram Azarnia

Akram Azarnia[1]

1. phd student of Psychology , Razi University, kermanshah, iran

Background and Aim : Specific learning disorder is a neuro-developmental disorder that affects the brain's ability to perceive or process verbal or non-verbal information effectively due to the interaction of effective genetic and environmental factors. One of the vulnerable areas in children with learning disabilities is their weakness in controlling attention, which ultimately affects the educational status and life of these children. The purpose of this study was to investigate the effect of virtual reality-based mindfulness therapy on improving attention control in students with specific learning disorders.

Methods : This study was semi-experimental with pre-test and post-test. The population included all third grade to sixth female students with learning disabilities in the city of Kermanshah Of them, 26 patients were selected and divided into control and experimental groups. Research Instruments included the Colorado Learning Difficulties Questionnaire (CLDQ) and the Wechsler Intelligence Scale for children- fifth edition, and the Attention Control Questionnaire (ACQ) of Dirberry and Reed. Mindfulness intervention program based on virtual reality of Psious company was implemented in 8 sessions of 20 to 30 minutes once a week for the study group.

Results : Covariance analysis indicated that the effectiveness of computer-based cognitive rehabilitation caused reduction in children's cognitive avoidance ($P<0/001$).

Conclusion : The results of this study showed that mindfulness therapy based on virtual reality can improve attention control by encouraging patients to "be here now". In fact, the illusion of "presence" in virtual reality can help patients concentrate and prevent them from being distracted, and thus help maintain their attention to the desired stimulus. On the other hand, virtual reality can make mindfulness interesting. Therefore, virtual reality-based mindfulness therapy can be used as an effective method to improve students' attention control.

Keywords : Specific Learning disorder; attention control;mindfulness therapy based on virtual reality

Count: 154
Abstract ID: 153
subject: Cognition: Attention
Presentation Type: Poster

Salience representation in croweded visual field in the neural activity of superior colliculus neurons

Submission Author: Zahra Khaleghi

Zahra Khaleghi[1], Hossein Azizi[2], Ali Asadollahi[3]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. 2Biology Department, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran

Background and Aim : There are so many stimuli around us at any given moment that their information can enter our brain as sensory inputs. Attention is a cognitive process that allows our brain to select the most relevant stimulus to ongoing behavior. Bottom-up control of attention allows the organism to quickly orient and respond to a salient, novel or dangerous stimuli. If the target stimulus has a unique feature, such as a different color, the search is completed very quickly and independently of the number of items in the array. This is called "popout search", which is dominated by stimulus-driven or bottom-up factors (stimulus salience). Previous studies have shown that with a few distractors, a normal crowding effect was observed. However, by increasing the number of distractors, the crowding effect was remarkably reduced. One possible mechanism for this observation is the pop-out effect following an increase in the number of distractors. Even though that there is some studies about pop out in primate and non-primte animals, the origin of it has not yet been precisely determined. In this study the aim was to investigate the representation of a salient stimulus in a crowded visual scene in neurons of the superior colliculus, a structure in the midbrain, (which is considered as an saliency map) in the marmoset monkey.
Methods : In this study, two adult male marmoset monkeys were used to conduct electrophysiological studies. After completing the behavioral training to perform visual tasks to investigate the representation of the stimulus inside the visual receptive field within a crowded scene, extracellular recordings were taken from the neurons of the superior colliculus.
Results : The results of this study showed that the increase of distractors up to the number of 11 stimuli decreases the response of neurons to the salient stimulus (both contrast and orientation features), due to the competition between the stimuli. While increasing the number of stimuli to more than this number, we saw the strengthening of the neuronal response, which indicates that the target stimulus has popped out. On the other hand, after examining the orientation feature, we found that the superior colliculus neurons are not sensitive to the orientation feature.
Conclusion : The results obtained from the study of electrophysiology indicate that pop-out occurred in the superior colliculus neurons, but there is no orientation sensitivity.
Keywords : superior colliculus; marmoset monkey; pop out; midbrain; single unit recording

Count: 155
Abstract ID: 180
subject: Cognition: Other
Presentation Type: Poster

The effect of stimulation of serotonin receptors (5-HT1A, 5-HT2A) on reducing fear and anxiety behaviors in male cats

Submission Author: Alireza Najafi

Alireza Najafi[1], Seyyed Ata Mousavi[2], Emad Khalilzadeh[3]

1. Faculty of the veterinary medicine, University of Tabriz
2. Faculty of the veterinary medicine, University of Tabriz
3. Faculty of the veterinary medicine, University of Tabriz

Background and Aim : Fear and anxiety are physiological emotions that play a protective role for humans or animals against external stimuli. Many behavioral problems in cats are caused by excessive fear and anxiety, which negatively affect the health and well-being of the pet and increase the likelihood of resistance to veterinary examination and the occurrence of aggressive behaviors. Therefore, in this study, it was tried to study cats' anxiety and fear behavior in its laboratory model by using the serotonin system and stimulating it with a serotonin-boosting drug (Trazodone) and serotonin receptor agonist (Buspirone).

Methods : For this purpose, 21 male mixed breed cats were studied. Cats were randomly divided into three experimental groups, entailing: 1- Control group which did not receive any medication 2- Trazodone group (20 mg / kg body weight) 3- Buspirone group (3 mg / kg body weight). Ninety minutes after oral administration of drugs, for the Open Field Test (OFT), each cat was placed in a separate room measuring three by four meters and walked freely in the room for ten minutes. In the human interaction test (HIT), a stranger sat with the cats in the center of the room, staring at a specific point and making no contact with the cat where the cats roamed freely in the room for another ten minutes. The behavior of the cats during all the tests were recorded, and then the behaviors of the cat's inertia, the number of times they made noise, the attempt to climb the wall, and the number of times they approached the human were analyzed. The data were evaluated by ANOVA RM in Graphpad Prism software version 5 and the Tukey pursuit test.

Results : In the control group, the amount of noise made in the HIT increased significantly compared to the OFT. Administration of Trazodone could considerably reduce the noises made in the OFT. Trazodone also significantly reduced meow sounds in the HIT. Administration of Buspirone in the OFT causes a significant reduction in meow sounds. Buspirone also reduced noises in the HIT. In the control group, the duration of immobility in the HIT increased

significantly compared to the OFT. Administration of Trazodone considerably reduced the time of immobility in the OFT. But in the HIT, it could not affect the duration of immobility. Administration of Buspirone in the OFT test significantly reduced the period of inactivity, however in the HIT test, it could not affect the duration of immobility.

Conclusion : Based on these results, it seems that both Trazodone and Buspirone have an appropriate and significant effect on reducing stress when the animal is with a stranger, while the impact of Trazodone on reducing stress behavior (meow sound production) is more potent and more effective when the cat is placed next to a stranger. Both Trazodone and Buspirone also reduced stress and anxiety behavior in cats against the animal's stress entering a new environment.

Keywords : Anxiety; Trazodone; Buspiron; Cat; Fear

Count: 156
Abstract ID: 167
subject: Cognition: Other
Presentation Type: Poster

Mirror Neurons and Music: Music Influences Social Interaction in Children with Autism Spectrum Disorder

Submission Author: Mahsa Ahadian

Mahsa Ahadian[1]

1. Ma in Clinical child and adolescent psychology, University of Tabriz, Tabriz, Iran.

Background and Aim : Mirror neurons (MN) represent a distinctive class of neurons in both area F5 of the premotor cortex and in the parietal area PF of the brain that discharge both when an individual executes a motor act and when he observes another individual performing the same or a similar motor act. Basically, autism spectrum disorder (ASD) is characterized by neuropsychiatric abnormalities such as a deficit in the social-cognitive domain. It is now suggested to be because of some abnormality of the mirror neuron development. Musical activities are multi-sensory and complex social activities which range from listening to music to being actively involved in making the music. Studies hypothesize that Intention understanding, imitation, synchronization, and shared experience during musical activities may be key elements of successful work in these areas of the brain.

Methods : This article is a review of published articles regarding music and its role in the improvement of social interaction in children with ASD.

Results : Music is a form of communication in which auditory representations elicit a variety of conscious experiences and in the case of group musical performance, synchronized, affective experience and communication can be experienced. Also, a musical phrase can be used to express an intention or emotional state, a listener can understand the intended expression of the sentence. It is clearly suggested that there is a direct link between musical experience and improvement of MN function which leads to a reduction in social symptoms of ASD.

Conclusion : It has been stated that music plays a role in the cognitive and social development of children with ASD. It may be the MN system, which subserves some of these effects, linking music perception, cognition and emotion via a mechanism which can enhance social interaction and intention understanding in children with ASD.

Keywords : Music, Music therapy, Mirror Neurons, Autism Spectrum Disorder, Social Interaction

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Count: 157
Abstract ID: 387
subject: Cognition: Other
Presentation Type: Poster

Popularizing the Therapic and Social Environment and Its Important Role in the Treatment of PTSD and Patients´ Rehabilitation

Submission Author: Balabeig Noormohammadi

Balabeig Noormohammadi[1], Hedayat Mazlomi[2], Saied Ghoshonizadeh[3], Hamidreza Abdi[4]

1. Provider
2. research fellow
3. research fellow
4. research fellow

Background and Aim : Wars are among the factors causing psychological stress in the modern life. Psychological traumas are significant problems in modern wars. It was not until the 19th century that psychological problems in armies and wars were dealt with sufficiently. Psychological problems were often considered as pretending and were not mentioned in medical reports. During Iraq war against Iran, post traumatic stress disorder (PTSD) was a prominent psychological complication evident among the warriors of the front of truth against falsehood. Based on the latest scientific definitions, a considerable number of sacrificers suffer PTSD. To begin, it should be established that the sacrificer community in Iran currently includes all the members of the martyrs´ families, veterans and their families, ex-prisoners of war and their families. Furthermore, a great number of western and southern citizens who were exposed to traumatic incidents during the eight-year holy defense are living around us in different cities, indicating particular symptoms of PTSD. A group of these citizens in western and southern Iran have been provided with the services of the Martyr Foundation and Veterans´ Affairs. But whether necessary measures were taken in the design of the houses, streets, parks, buildings, and urban environments to receive this group; whether there are any plans to familiarize people with these disorders and to instruct them how to interact with these disorders; and whether a warrior who witnessed traumatic incidents, an ex-prisoner of war who witnessed agonizing scenes of the war and suffered captivity, or martyrs´ parents who probably suffer PTSD after being informed about their children´s martyrdom enjoy enough peace of mind, considering the plans, designs, urban cultural works, media ads, news reports, and existing constructions.

Methods : In the present study, simple sampling was used and the due literature was reviewed. The warriors who were diagnosed as suffering PTSD at Seid Al-Shohada sanatorium in the southern military clinic were selected as the subjects of the study. Interviews and questionnaires were used to collect data from the sample.

Results : Today, behavioral-cognitive therapy, mainly including inaculative instruction, long-term imaginary encounter, cognitive process therapy, chemical theapy, and EMDR, is applied to cure this group of patients and help them return their homes and jobs. In systematic desensitization, based on counterconditioning principles, responses that are incompatible or inconsistent with the fear are initially identified. Then, clients are required to express these fear-inconsistent responses in the situations which cause fears. EMDR is a combined treatment method consisting of significant elements of basic treatment approaches. The combined method (psychodynamic-behavioral-cognitive-physiological-interactive) uses eye movement for treatment. Reprocessing of the experiences using EMDR make it possible for the clients to become aware of their experiences of the incident, and through cognitive reevaluation, change their inappropriate emotions and physical reactions into compatible behaviors. The combined method is considered helpful for solving psychological problems originated from extreme stress. Although stress can affect the development of a great deal of emotional disorders, experiencing traumatic stress is a necessary factor for suffering from PTSD.

Conclusion : Given the increased stress disorders, popularizing this disorder and training people and familiarizing them with the behavioral-cognitive treatment can considerably reduce the duration of this illness and provide the patients with relaxation.

Keywords : Sacrificers, Cognitive-Behavioral Treatment, War, PTSD

Count: 158
Abstract ID: 228
subject: Cognition: Other
Presentation Type: Poster

The effectiveness of transcranial electrical stimulation treatment on depression in mothers with children and adolescents with cancer

Submission Author: Fariba Gheisvandi

Fariba Gheisvandi[1], tahere haji seyed javadi[2], ali tavakoli banizi[3]

1. Author
2. Supervisor
3. Supervisor

Background and Aim : One of the most common disorders leading to the death of children is cancer, which despite many advances in the treatment of this disease, this diagnosis is still very scary for the child's family members and causes major changes in their lives and many mental disorders for their parents. One of the techniques that has received attention in improving mental disorders and improving cognitive processes today is the use of transcranial direct current electrical stimulation as a non-pharmacological and non-invasive treatment method.

Methods : In this research, the target sample was selected as available and after clinical interview by a psychologist and a psychiatrist, they were diagnosed with major depressive disorder based on the diagnostic criteria of DSM-5 and in addition, using the Beck Depression Scale, second edition, which is used to measure The severity of depression symptoms obtained a score higher than 18 and met the criteria for inclusion and exclusion from the research, they were selected.

Results : In families where a child is diagnosed with cancer, parents will have to take care of their child's medical care in addition to the busyness of life. As a result of this, they are faced with various issues such as financial issues, changes in parental roles, resentment of other children, problems in psycho-social adaptation, problems in communication behaviors with the sick child and other children, frequent hospitalizations and finally bereavement. The most common reaction to cancer is stress and depression. From the results of the research that used the effectiveness of transcranial electrical stimulation on the dorsal-lateral prefrontal cortex of healthy people as well as people with psychiatric disorders, it can be seen that this treatment method is an effective treatment protocol to reduce the symptoms of major depressive disorder. and in addition to improving mood and emotional states, it increases cognitive performance such as planning, mental-motor speed and working memory.

Conclusion : The present study showed that transcranial electrical stimulation as a therapeutic tool and method reduces the symptoms of depression and its scores. In fact, transcranial electrical stimulation improves the ability of the brain to process input information. This feature also increases the effectiveness of other treatment approaches. According to the evidence and results of this study, it is suggested that this treatment method be used by psychologists, psychiatrists and psychotherapists in psychological service centers and clinics as a treatment and prevention method.

Keywords : Electrical stimulation, children's cancer, maternal depression, transcranial electrical stimulation

Count: 159
Abstract ID: 117
subject: Cognition: Other
Presentation Type: Poster

The Effects of Myrtenol Inhalation on spatial learning and memory and synaptic plasticity Impairments Due to Experimental Asthma .

Submission Author: Mohammad Amin Rajizadeh

Mohammad Amin Rajizadeh[1]

1. Kerman university of medical sciences

Background and Aim : Asthma is a chronic disease with significant health burden and socioeconomic and racial/ethnic disparities related to diagnosis and treatment. Asthma primarily affects the lungs, but can impact brain function through direct and indirect mechanisms. Some studies have suggested that asthma negatively impacts cognition. In this study, we evaluated the effects of myrtenol as a monoterpene on cognitive disorders following asthma in behavioral and synaptic levels.

Methods : The allergic asthma was induced by sensitization followed by the inhalation of ovalbumin (OVA). Male wistar rats were divided into five groups: Control, Asthma, Asthma / Vehicle, Asthma / Myrtenol and Asthma/Budesonide. Myrtenol (25 mg/kg) or Budesonide (2.5 ml) was administered by inhalation route once a day for one week, at the end of the inhalation period. Behavioral test (MWM) and field potential recording measurement performed for evaluation of cognitive performance.

Results : Our results showed that myrtenol could improve spatial learning & memory and LTP impairments following allergic asthma.

Conclusion : Myrtenol as a herbal compound can alleviate cognitive impairments following asthma.

Keywords : Asthma , Cognition , Long term potentiation , Myrtenol

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Total Annexin V-positive versus Annexin V-negative microvesicles count in the CSF of Aβ-treated rats

Submission Author: Leila KarimiZandi

Leila KarimiZandi[1], Leila Karimi-Zandi[2], Tahereh Ghorbandaiepour[3]

1. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Neurosciences and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : The microvesicles (MVs) as a signaling marker of neuron to neuron communication have received a lot of attention in the CNS studies. In the stress conditions like Alzheimer disease (AD), translocation of phosphatidylserine to the outer leaflet is the initial event that will ultimately lead to the MVs shedding. Annexin V is a high-affinity ligand for phosphatidylserine. There are some arguments if Annexin V-negative MVs also should be considered as MVs.

Methods : . In this study, we compared the number of Annexin V-positive and Annexin V-negative MVs in amyloid-β (Aβ)-treated rats. To achieve this goal, we induced an AD model by bilateral injections of Aβ into the rat cerebral ventricles. Thioflavin T staining was used to confirm the presence of Aβ fibrils 14 days post-Aβ injections. Also, to elucidate the number of MVs, we analyzed the CSF by flow cytometry.

Results : Our results demonstrated that the CSF levels of the total number of MVs, increased 14 days after Aβ injection (p= 0.008). Moreover, our data from the current study indicated that the number of Annexin V-positive MVs was significantly higher than Annexin V- MVs in all of the groups (p= 0.0068).

Conclusion : The total number of MVs was increased in the CSF of Aβ-treated rats. However, the most of these MVs were Annexin V-positive, which may emphasizes that Annexin V-positive MVs have potentially a greater contribution in the pathophysiology of the AD.

Keywords : Alzheimer's disease; Annexin V-positive; Annexin V-negative; Microvesicles

Count: 161
Abstract ID: 402
subject: Cognition: Other
Presentation Type: Poster

The effect of transcranial direct current stimulation (tDCS) on brain waves in rats

Submission Author: Sepideh Khaksar

Sepideh Khaksar[1], Ali Noorbakhsh[2], Sanaz Amirabadi[3]

1. Department of Plant Sciences, Faculty of Biological Sciences, Alzahra University, Tehran, Iran
2. Department of Psychology, Sana Institute of Higher Education, Sari, Iran.
3. Department of Biology, Science and Research Branch, Islamic Azad, University, Tehran, Iran.

Background and Aim : Lack of effectiveness in conventional medications and serious adverse effects of pharmacotherapy have increased the need to find alternative non-pharmacological procedures with more safety. Recently, transcranial stimulation method was attracted attention of many researchers. Transcranial direct current stimulation (tDCS) is a non-invasive and painless therapeutic strategy. Advantages of this technique compared with similar techniques are low-cost, high security, less side effect, and more efficacy. In this neuromodulatory technique, an electric current is delivered between anodal and cathodal electrodes over the scalp. Moreover, electrical activity from the brain is displayed in the form of brain waves. There are five categories of these brain waves, ranging from the most activity to the least activity. Each of brain waves represents a distinct neural activity in neocortex. The aim of this study is to evaluate changes of brain waves after short-term and long-term transcranial direct current stimulation.

Methods : In this study, 15 Wistar male rats (120±20 gr) were divided into three (intact (n=5), short-term tDC stimulation (n=5), long-term tDC stimulations (n=5)) groups. In intact group, the electroencephalography (EEG) recording was performed using ewave hardware and eprobe software (ScienceBeam Co., Istanbul, Turkey, www.Sciencebeam.com). Rats of tDCS-groups were anesthetized and an anodal electrode was connected to right anterior cingulate cortex (ACC) (AP: +1.9 mm, ML: +0.9 mm) using stereotaxic apparatus. Electrode was connected into the electrode holder filled with NaCl (0,9%). A cathodal electrode was also attached to the thorax of the rat. A single 0.2 mA electrical stimulation for 20 min was conducted for short-term tDCS group (using eStim instruments, ScienceBeam Co., Istanbul, Turkey). For long-term stimulation, tDCS stimulation was done for consecutive five days. Then, brain waves were measured by EEG recording.

Results : Results showed that both short-term and long-term tDCS stimulations on right anterior cingulate cortex were led to decrease in delta and theta oscillations (as low frequency of brain waves) and increase in alpha and beta oscillations (as high frequency of brain waves).

Conclusion : According to achieved results, it is stated that tDCS could enhance electrical activity of neurons and connectivity state within cortical area of rat brain. These preliminary findings are promising for developing a therapeutic method against psychiatric disorders with cognitive, attention, and concentration deficits.

Keywords : tDCS, EEG recording, Brain waves

Count: 162
Abstract ID: 469
subject: Cognition: Other
Presentation Type: Poster

Applying nasal air-puff during mechanical ventilation accelerates recovery from isoflurane anesthesia

Submission Author: Mohaddese Nemati

Mohaddese Nemati[1], Sepideh qazvineh[2], Mohammadreza raoufy[3]

1. Tarbiat modares University
2. Tarbiat modares University
3. Tarbiat modares University

Background and Aim : Mechanical ventilation (MV) is a life-saving intervention in patients but it has some side effects such as cognitive impairments. Prolonged recovery of consciousness increases the risk of these cognitive impairments. It is shown that nasal air-puff during MV changes the functiaonal connectivity between olfactory bulb (OB), medial prefrontal cortex (mPFC) and hippocampus (HPC). Also there is evidence that connectivity changes during recovery affect the recovery time. Therefore, we investigated whether nasal air-puff during anesthesia can change the connectivity between OB, mPFC and HPC during recovery from anesthesia and accelerate recovery.

Methods : Male Wistar rats were anesthetized by 4% isoflurane and then intubated. During anesthesia and mechanical ventilation, air-puff was pushed into the nose (frequency = 1Hz) in nasal air-puff group. After 2 hours of anesthesia, the rats were extubated. The animals were then exposed to 100% oxygen in a body box and the recovery time was assessed. During the recovery, local field potentials were recorded from OB, mPFC and HPC.

Results : Applying nasal air-puff increased high gamma (120-160Hz) coherence between OB, mPFC and HPC. Also nasal air-puff increased high gamma OB-HPC and mPFC-HPC correlation but not OB-mPFC correlation. Evaluation of awaking time showed that rats in nasal air-puff group woke up earlier than other group.

Conclusion : The present study showes that applying nasal air-puff accelerates recovery of consciousness after anesthesia by changing the functiaonal connectivity between OB, mPFC and HPC.

Keywords : Olfactory bulb; Nasal air puff; Recovery; Hippocampus; Medial prefrontal cortex

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Count: 163
Abstract ID: 362
subject: Cognition: Other
Presentation Type: Poster

transgenic mouse models of cerebellar disorders

Submission Author: Alireza Lotfi

Mehdi Mehdizadeh[1], Zahra Abroodi[2], Alireza Lotfi[3]

1. Reproductive Sciences and Technology Research Center, Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
3. Department of Anatomical Sciences, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : To date, the treatment of sensorimotor problems in cerebellar disorders is considered as an unsolved puzzle, although efforts have been made to improve this condition in the future. Cerebellar diseases are multifactorial disorders, which both environmental and genetic factors play important roles in their development. A large number of these disorders, such as Dandy-Walker Syndrome, Joubert Syndrome and Cerebellar Hypoplasia have been identified. They show symptoms such as ataxia, abnormal gait, and numerous behavioral and speech problems. Animal models play an important role in understanding the pathophysiology of various diseases and their treatment, thereby challenging and costly human studies are avoided. Animal models are divided into several categories. One of these categories is genetically modified (transgenic) models, which have recently been produced for specific study purposes through the advancement of molecular biology. These models help to better understand the gene-phenotype relationship and gene-disease interactions.

Methods : In the recent systematic review, the key words "transgenic", "cerebellar disorders" and "mouse" from 2000 to 2022 were searched in Google Scholar, PubMed and Scopus databases. Articles related to the subject of the study were selected and reviewed.

Results : To date, a lot of new mouse models of cerebellar disorders have been introduced. Each of them has its strengths and weaknesses which is explained in detail.

Conclusion : The aim of the current study is to investigate the genetic models for cerebellar disorders from various points of view to help researchers choose the valid animal model according to their studies.

Keywords : cerebellar disorders; transgenic; mouse

Count: 164
Abstract ID: 349
subject: Emotion, Motivation
and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

How subtle threat is recognized: The role of facial expression intensity in the recognition of anger and fear

Submission Author: Mona Izadi

Mona Izadi[1], Delnia Miri[2], Setareh Mokhtari[3]

1. Institute for Cognitive & Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive & Brain Sciences, Shahid Beheshti University, Tehran, Iran
3. Institute for Cognitive & Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : Although both fearful and angry facial expressions are assumed as threatening stimuli, they convey different types of threatening information. That is, a fearful face is an indicator of existing danger in the environment; while, an angry face is a signal of direct and more specified source of threat. Despite the vital role of early recognition of angry and fearful faces in survival, little is known about recognition of these emotions when their expression is subtle (i.e., not easily recognizable). Therefore, the aim of this study was to investigate the recognition of angry and fearful facial expressions when the emotional cues are subtle.

Methods : Eighty-five adults completed an emotion recognition task in which 24 emotional faces (i.e., angry and fearful) were presented at different intensities (10%, 50%, 100%). The participants' task was to label each facial expression as fearful, angry, happy, sad, or neutral by moving a computer joystick. The face stimulus was presented for 500 milliseconds in each trial. The reaction time data and the accuracy of the responses of participants were collected.

Results : Our results revealed that for both emotions by increasing the intensity of the expressions, participants could recognize the accurate emotion more effectively. Additionally, we observed that when the expression is very subtle (the intensity of emotion is at 10%), there was not any significant difference in the percentage of angry and fearful recognition. similarly, there was no difference in the speed of recognizing very subtle (10% intensity) angry faces compared to recognizing fearful faces. At the intensity of 50% and full (100%), the accuracy rate was significantly higher in recognizing angry faces Than fearful faces, also, the reaction time for recognizing angry faces at 50% and full intensity was faster than fearful Faces with similar emotional intensity.

Conclusion : In general, there was no difference in reaction time and accuracy rate of recognizing angry and fearful faces when the expression is very subtle (10% intensity). However, the accuracy rate of recognizing angry faces at 50% intensity was significantly higher than fearful faces with the same intensity. similarly, at the intensity of 50% the speed of recognizing angry faces was faster than recognizing fearful faces with the same intensity. The result may show an advantage for recognizing angry faces even when the emotional cue is subtle which can be due to the role of anger in conveying a direct and more specified source of threat and its importance for survival.

Keywords : fear; anger; expression intensity; survival

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The effectiveness of neurofeedback on executive function, attention and anxiety in elementary school students

Submission Author: Alireza Yaghobi

Alireza Yaghobi[1], mehdi yaghobi[2]

1. PayamNoor univercity, Noorabad Delfan branch
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aim of this study was to evaluate the effectiveness of neurofeedback on executive function, attention and anxiety in elementary school students.

Methods : The present study is a Semi-experimental study that was performed on students in Delfan. 42 girl students were selected from schools in Delfan. Also, were placed in groups, including: experiment group and control group.21 student in experiment group and 21 of them in control group. Participants first completed a demographic information questionnaire. The researcher then performed Spence Children's Anxiety Scale (SCAS), Coolidge Neurological Test and Connors Attention Questionnaire. The data were analyzed using descriptive and inferential methods using SPSS-24 program.

Results : The results showed that neurofeadback is effective in reducing anxiety of students and strengthens their executive function and attention

Conclusion : : The results show that neurofeadback improving executive function and attention, also reducing anxiety in bully students. Findings show that the neurofeedback can strengthen attention and cognitive abilities and consequently the academic performance of students while reducing their anxiety. Therefore, it can be a good intervention for improving student's function.

Keywords : neurofeadback, anxiety, attention, executive function, student.

Count: 166
Abstract ID: 125
subject: Emotion, Motivation
and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

Nasal administration of Silver nanoparticles (AgNPs) and Silver ions (AgAc) reduced cognitive performance in adult rats

Submission Author: Javad Farimaneh

Javad Farimaneh[1], Seyed Reza Fatemi Tabatabaei[2]

1. Department of physiology, Faculty of Veterinary Medicine, Shahid Chamran university of Ahvaz, Ahvaz,Iran
2. Department of physiology, Faculty of Veterinary Medicine, Shahid Chamran university of Ahvaz, Ahvaz,Iran

Background and Aim : AgNPs showed an adverse effect and toxic impact on human cell bodies. Passing the blood-brain barrier and increasing oxidative stress can change different parts of the brain such as the hippocampus. So, the purpose of this investigation was to explore the possible neurotoxicity of silver nanoparticles in adult rats.

Methods : Neurotoxicity was done in rats by treating NP 3 and 15 mg/kg, also AgAc every two days for 20 days intra-nasally. Animals were divided into five groups: control, vehicle, NP3, NP15 and AgAc. Behavioral assessments such as Morris water maze and elevated plus maze, and assessment of biomarkers such as malondialdehyde assay, were used to evaluate cognitive impairment and molecular changes induced by silver.

Results : The results revealed that NP15 and AgAc significantly could impair spatial memory. Moreover NP3, NP15, and AgAc can increase anxiety in animals. Additionally, MDA was significantly increased by NP3 and NP15.

Conclusion : Our research finding showed silver nanoparticles and ions, particularly NP15, result in neurotoxicity and behavioral impairments.

Keywords : Silver nanoparticles, Silver ions, Neurotoxicity, Learning and Memory, Anxiety-like behaviors.

Count: 167
Abstract ID: 422
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Impacts Of Chronic Partial Sleep Deprivation And Circadian Rhythm Alterations On Sperm Parameters In Rats

Submission Author: Saeed Rastgoo

Saeed Rastgoo[1], Mohammad Mahdi Hassanzadeh-Taheri[2], Mohammad Reza Saebipour [3], Mohammad Reza Doostabadi [4], Mehran Hosseiny[5], Shirin Rezazadeh [6]

1. Birjand University of Medical Sciences, Department of Anatomical sciences, Msc Student of Anatomical Sciences
2. Birjand University of Medical Sciences, Department of Anatomical sciences, Professor
3. Birjand University of Medical Sciences, Department of Anatomical sciences, Professor
4. Birjand University of Medical Sciences, Department of Anatomical sciences, Assistant Professor
5. Kerman University of Medical Sciences, Department of Anatomical sciences, PhD Student of Anatomical Sciences
6. Birjand University of Medical Sciences, Department of Anatomical sciences, Msc Student of Anatomical Sciences

Background and Aim : Nowadays, due to the global access to the electricity the long night-working hours are increased and in consequence sleepiness and insomnia have been increased. According to the physiology of the reproductive system and its relationship with sleep and light/dark cycle, it seems that the function of this system alters with the sleep patterns. Despite this fact, few studies have been done on acute effects of sleep deprivation on reproductive system. In addition, no study was investigated the impact of chronic and partial insomnia along with the disruption of the light/dark cycle on male fertility indicators, including sperm parameters. So, this study was designed to investigate the effect of chronic partial sleep deprivation and light/ dark cycle disturbances on rat sperm parameters.

Methods : In this experimental study, 40 male Wistar rats (8-week-old) were divided into 5 groups: control (C), circadian disruption (CD), sleep deprivation in light phase (SD+AM), sleep deprivation in dark phase (SD+PM), sleep deprivation with circadian disruption (CD+SD). In order to induce chronic sleep deprivation, rats were placed on a programmable sleep deprivation machine 4 hours per day for four weeks. Also, the normal light/dark cycle was changed in circadian rhythm disruption groups. Finally, the sperm samples were harvested from epididymis and the parameters of motility, viability, morphology, residual histones in DNA, chromatin integrity and DNA fragmentation were evaluated.

Results : After four weeks of intervention, sperm motility in CD and CD+SD groups was lower than in C group. Also, sperm viability in the SD+PM and CD+SD groups was significantly decreased. Compared to the C group, sperm DNA evaluation revealed significantly increases DNA fragmentation in all studied groups and the highest rate was observed in the CD+SD group. Moreover, multiple comparison tests were done. According to the results, CD+SD group showed significant differences in comparison with both SD+AM and SD+PM groups in this parameter. No statistically difference in the other studied parameters like morphology, chromatin integrity and residual histones was found between the studied groups.

Conclusion : The result of this study demonstrated that circadian cycle disturbances accompanied with the chronic partial sleep deprivation, can negatively affect sperm motility, viability and DNA fragmentation in rats.

Keywords : Chronic sleep deprivation; Light/Dark cycle; circadian rhythm; Sperm parameters

Count: 168
Abstract ID: 308
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Does cancer make sleep disorders or vice versa? A Short Review

Submission Author: Arian Tabatabaei

Sara Moslehi[1], Arian Tabatabaei[2], Golnaz Dehghani[3], Samin khlifehSoltani[4], Minoo Hashemi[5]

1. Medical Student, Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
2. Medical Student, Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
3. Medical Student, Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
4. Medical Student, Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
5. Department of psyciatrics , Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran

Background and Aim : Sleep disorders and cancer have become increasingly prevalent worldwide. Over the past decade, the critical role of sleep in health and diseases has been underscored by research elucidating the relationship between sleep and physiological and psychological functions. Much evidence has shown sleep disorder as a symptom in cancer patients. Cancer disrupts sleep by causing pain, fatigue, and depression, while much evidence has shown sleep disorder as a symptom in cancer patients. Therefore, the progress and delay of sleep disorder are discussed as a cause or consequence. This study represents the relationship between sleep disorders and cancer in a short review.

Methods : The keywords mentioned were searched in Google Scholar and PubMed databases in the last 5 years. After screening the title and abstract, 25 articles were selected for this short review.

Results : Increasing evidence shows that patients with various sleep disorders such as insomnia and OSA are at a higher risk of developing and accelerating types of cancers, especially ovarian and breast cancer. So that the prevalence of sleep disorders in all types of cancers can reach 95%. Studies have also explored the complex interplay between sleep and other common cancer symptoms, particularly fatigue, depression, and pain, and have identified risk factors associated with developing sleep problems in this population. On the other hand, it seems that one of the mechanisms causing sleep disorders is the suppression of melatonin, which together with the

deregulation of clock genes, may potentially lead to the promotion and induction of cancer, especially in endocrine tissues. is that the disturbance in the circadian rhythm along with disturbed homeostasis leads to tumorigenesis related to sleep disturbance. Endogenous circadian homeostasis is frequently disrupted in modern civilizations, leading to an increased risk of many disorders, including lung cancer.

Conclusion : Recent scientific evidence suggests that knowledge and management of sleep disorders offer interesting therapeutic perspectives for cancer treatment, although the specific relationship between individual sleep disorders and specific tumors is not very clear. Articles emphasize the possibility of the two-way relationship between sleep and cancer. Mechanisms in this field were introduced as hypotheses, but more clinical studies are needed to understand the exact mechanism of interaction between these two diseases.

Keywords : Sleep; Sleep disorder; cancer; Sleep disturbances;

Count: 169
Abstract ID: 113
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Investigating the injection of L-arginine in the nucleus accumbens on morphine dependence at different hours of the day in rats

Submission Author: Sina Sohrabi

Sina Sohrabi[1], Behzad Garmabi [2], Pouneh Zolfaghari [3], Mohammad Bagher Sohrabi [4]

1. Student Research Committee, School of Dentistry, Golestan University of Medical Sciences, Gorgan, Iran
2. Department of Neuroscience, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
3. Vice-chancellery of Health, Shahroud University of Medical Sciences, Shahroud, Iran
4. School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Background and Aim : Dopamine neurotransmission in the mesolimbic system and especially in the nucleus accumbens is generally known as the main target of narcotic drugs in euphoria. A high concentration of nitric oxide synthetase (NOS) enzyme is found in this nucleus. This enzyme is responsible for the production of nitric oxide from L-arginine in the central nervous system. Nitric oxide is an important chemical mediator in the central nervous system, which plays a role in the development of morphine dependence and leads to the release of dopamine in the nucleus accumbens. Previous research has shown that nitric oxide plays a role in the acquisition and persistence of psychological dependence on various narcotic drugs in different models of dependence studies. Circadian rhythms are actually daily periodic fluctuations in the organism's physiology, metabolism or behavior. Among the areas of the brain that were seen to have a pattern of daily changes are the areas related to reward. Areas such as the mesocorticolimbic pathway, which is considered the main reward processing center in the brain. It has been seen that the areas related to addiction in the brain have a pattern of daily changes in their biochemical and cellular molecular interactions (such as the daily pattern in the release of dopamine and the expression of its receptors). In this regard, some other research shows that nitric oxide is also secreted in the suprachiasmatic nucleus and its pattern is under the control of the circadian rhythm. Considering the above and the lack of sufficient research, in this study we decided to investigate the role of nitric oxide on morphine dependence at different times of the day through the injection of L-arginine.

Methods : In this design, conditioned place preference was used using biased method, and each period lasted 9 days. For the experiment, 56 male rats weighing 250-300 grams were purchased

and divided into eight groups randomly. Of these, four groups received morphine-saline and included morning/morning (8-9am), evening/evening (6-7pm), morning/evening and evening/morning groups. The next four groups were exactly the same as these groups, with the difference that they received L-arginine drug five minutes before morphine. Morphine at a dose of 0.5 mg per kilogram of animal weight was injected intraperitoneal, and L-arginine (one microgram per animal) and saline (1 microliter per animal) were injected into the nucleus accumbens and intraperitoneal, respectively.

Results : The results of the research showed that injecting L-arginine along with morphine at all hours of the day significantly increases the animal's dependence on this drug. On the other hand, the injection of L-arginine along with morphine and its comparison between morning/morning, evening/evening, morning/evening and evening/morning groups showed that the time of day has no effect on the severity of dependence.

Conclusion : Our findings show that L-arginine can increase dependence on morphine and this effect is not related to changes in the time of day.

Keywords : Circadian, L-arginine, Morphine, Nitric oxide

Count: 170
Abstract ID: 160
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

The relationship between sleep deprivation and NLRP3 Inflammasome: a narrative review

Submission Author: Mohammad Amini

Mohammad Amini[1], Gholamreza Hassanzadeh [2], Zahra Yousefi [3], Sayed Soran Ghafori [4]

1. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine (SATiM), Tehran University of Medical Sciences (TUMS), Tehran, Iran.
2. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine (SATiM), Tehran University of Medical Sciences (TUMS), Tehran, Iran.
3. School of Allied Medical Sciences, Shahroud University of Medical Sciences, Shahroud, Iran.
4. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine (SATiM), Tehran University of Medical Sciences (TUMS), Tehran, Iran.

Background and Aim : In the modern era, sleep deprivation (SD) is one of the most common health problems that has a profound influence on an individual's quality of life and overall health. Studies have identified the possibility that lack of sleep can stimulate inflammatory responses. NLRP3 inflammasome, a key component of the innate immune responses, initiates inflammatory responses by enhancing proinflammatory cytokine release and caspase-1-mediated pyroptosis. Here, NLRP3 modification, its proinflammatory role, and potential targeted therapies will be reviewed with regard to SD-induced outcomes.

Methods : We identified relevant studies by searching the electronic databases of PubMed, Medline (Ovid), Embase (Ovid), and Web of Science. All searches were limited to studies in English and the reference lists of retrieved articles were searched for additional pertinent studies.

Results : We note a growing body of evidence have determined the importance of the mechanistic connections between NLRP3 and SD-induced detrimental consequences, but there are still several pieces of the puzzle to be put in place. For ethical reasons, clinical studies cannot evaluate the expressions of NLRP3 inflammasome in the human brain, which can directly reflect the effects of sleep on neuroinflammation, and thus there is a need for more clinically relevant data. In animal research, issues and challenges can be seen from different viewpoints: (i) some animals show differential vulnerability to the effects of SD compared to humans. (ii) Additionally, the effects of sleep differ depending on the SD technique employed and the length of SD. Moreover, paying

attention to the crosstalk of all the driving factors of NLRP3 inflammasome activation, such as inflammatory responses, autonomic control, oxidative stress, and endothelial function is highly recommended to prevent possible comorbidities, which are commonly seen in patients.

Conclusion : In conclusion, NLRP3 inflammasome or its downstream pathways is a potential target for therapy in order to improve the clinical outcomes of SD. However, the treatment process can be complicated due to the reciprocal and complex relationship of SD with NLRP3 inflammasome activation.

Keywords : Sleep Deprivation, Inflammation, NLRP3 Inflammasome

Count: 171
Abstract ID: 366
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Behavioral modification by sleep manipulation

Submission Author: Mohammad Reza Saebipour

Mohammad Reza Saebipour[1], Sara Hamdamian[2], Zahra Keshtgar[3], Mahdieh Sabouri[4], Aminollah Golrou[5]

1. Faculty of medicine, Birjand University of Medical Sciences
2. Neurologist
3. PhD candidate in Neuroscience, Tabriz University of Medical Sciences
4. PhD candidate in Electrical Engineering, Birjand University
5. PhD in Biomedical Engineering, Birjand University of Medical Sciences

Background and Aim : Sleep plays an important role in cognitive functions, mainly processing daily experiences and memories and consolidating them. This makes up a relationship between brain and behavior by sleep-dependent learning and memory consolidation. There are evidences that targeted activation of memories during non-REM sleep in not only results in memory stabilization, but can help modification of behaviors such as smoke cession.

Methods : Trying to use sleep manipulation methods to encourage healthy behaviors such as exercise and inhibiting non- healthy ones, we have designed a special language for this purpose. We have also used different sensory modalities to examine the possibility of conveying more complex concepts during sleep.

Results : Although the scope of created words is limited, but our initial investigations show, the possibility of applying grammatical rules and rich advice phrases in the form of short sounds is promising.

Conclusion : This artificial and fast language should be optimized over a reasonable period of time, the initial results indicate that its limited range of words is capable of rapid learning for the audience.

Keywords : sleep manipulation, targeted memory reactivation, behavioural modification

Count: 172
Abstract ID: 304
subject: Emotion, Motivation
and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

The association of Attention Deficit /Hyperactivity Disorder with sleep disorder: A review

Submission Author: Arman Malekkhouyan

Arman Malekkhouyan[1], zahra hajisalehi[2], zahra mahmoodian[3]

1. medical student,clinical research development center, najafabad branch, islamic azad university, najafabad, iran
2. medical student,clinical research development center, najafabad branch, islamic azad university, najafabad, iran
3. medical student,clinical research development center, najafabad branch, islamic azad university, najafabad, iran

Background and Aim : Sleep disorder is one of the most common complaints nowadays, which can have serious consequences on the health and quality of patient's life. While most sleep disorders can be managed with timely intervention, treatment can be challenging. Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders diagnosed in children, which can continue into adolescence and adulthood .It is main manifestations include: inattention, concentration disorder, and hyperactivity (impulsivity). This short review study tries to examine those articles dealt with the relationship between sleep disorder and ADHD.

Methods : By searching the keywords mentioned in PubMed and Google Scholar among the English articles of the last seven years, 52 articles were preliminary examined. By studying their summary, 5 articles were removed due to lack of proper relationship with our research purpose, and 44 articles witch exactly related to the topic were subjected to the final review. The reviewed studies included cohort, observational, interventional, and systematic review articles.

Results : The relationship between ADHD and sleep disorder is not known precisely, but according to the available evidence, there is a mutual relationship between them .Also, the findings of some studies show that sleep problems can cause symptoms similar to ADHD in children by disrupting in behavior and the concentration ability .It is challenging for doctors to distinguish it from the neurodevelopmental disease of children's hyperactivity, Since ADHD is a neurodevelopmental disease, it is highly recommended to know the history of presenting

symptoms to distinguish it from other problems. Studies show that ADHD can cause sleep disorders in two ways: 1 . The direct role of the disease on the circadian rhythm and disrupting the light sleep phase. 2. Side effects of drugs used to treat this disease. Psychostimulants are the mainstay of ADHD drug treatment, but they do not help sleep problems and can exacerbate them. In a large subgroup with ADHD, psychoeducation and sleep hygiene, and chronotherapy also play an important role in the treatment of ADHD symptoms associated with sleep disturbance.

Conclusion : Our research shows that there is a two-way relationship between sleep disorder and ADHD neurodevelopmental disease .Also, the sleep disorder can appear with symptoms similar to ADHD, so it is important to distinguish between these two disorders .investigating the relationship between these two disorders requires more extensive research.

Keywords : sleep disorder;ADHD;attention deficit hyperactivity disorder

Nanocurcumin substantially alleviates noise stress-induced anxiety-like behavior: The roles of tight junctions and NMDA receptors in the hippocampus

Submission Author: Azam Alinaghipour

Azam Alinaghipour[1], Mahmoud Salami [2], Fatemeh Nabavizadeh[3]

1. Department of Physiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran.
2. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Islamic Republic of Iran
3. Department of Physiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran.

Background and Aim : Environmental noise stress affects non-auditory brain regions such as the hippocampus; an area of the brain implicated in cognition and emotion. Recent experimental data indicate that dysfunction of the blood-brain barrier (BBB) and overexpression of NMDA receptors may cause anxiety. In this experiment, we evaluated the effect of nanocurcumin on anxiety-like behavior and the expression of tight junctions and NMDA receptor subunits in the hippocampus of rats exposed to traffic noise.

Methods : Forty rats were assigned to control (CON), stress (ST), nanocurcumin (NC), and nanocurcumin+stress (NC+ST) groups. Anxiety-like behavior was evaluated through an elevated zero maze apparatus. The gene expression of tight junctions and NMDA receptor subunits was examined by real-time PCR in the hippocampus.

Results : Statistical analysis showed that noise exposure developed anxiety-like behavior and elevated the corticosterone level in the ST group compared to the CON group. The nanocurcumin administration decreased the stress and anxiety in the NC+ST group compared to the ST animals. While the noise stress reduced the gene expression of tight junctions occludin, claudin-5, and ZO-1, the nanocurcumin administration increased them in the NC+ST animals. Furthermore, the noise stress elevated the gene expression of the NMDA receptor subunits GRIN1 and GRIN2B. The NC+ST animals showed a modification of these subunits compared to the ST animals.

Conclusion : Our findings showed that noise exposure promotes stress and anxiety and impairs the NMDA receptor structure and BBB integrity. The nanocurcumin treatment partly restores the destructive effects of noise exposure.

Keywords : Hippocampus; NMDA receptor; Nanocurcumin; Noise; Stress; Tight junction

Count: 174
Abstract ID: 234
subject: Emotion, Motivation
and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Functional interaction between nitric oxide and nicotinic cholinergic systems on acute stress-induced spatial memory deficits in male Wistar rats

Submission Author: Zahra Rostami

Zahra Rostami[1], DelaramEslimi Esfahani[2], Ameneh Rezayof[3]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Department of Biology, Faculty of Science, Tehran University, Tehran, Iran

Background and Aim : Memory is one of the most basic components of cognition in humans , and researchers have sought to find ways to eliminate memory defects and factors affecting it, including stress and stressful factors. In the meantime, investigating the effect of different substances on improving the memory process, especially spatial memory and learning and improving it, has been very important. Nicotine has always attracted special attention due to its close relationship with the cholinergic system due to its ability to pair with acetylcholine receptors that play an active role in cognitive processes such as spatial memory and learning and the nitric oxide system. In many studies, it has been shown that nicotine improves the cognitive performance of humans and laboratory animals, and based on this, nicotine interventions are being developed as therapeutic interventions for memory deficits, especially spatial memory, and its improvement. Also, agonists and antagonists of the nitric oxide system are very important in the processes of memory formation and destruction. on the other hand, factors such as stress can have a negative effect on memory and its function and cause cognitive and perceptual disorders

Methods : Male Wistar rats in the weight range of 200-250 grams were obtained from the Laboratory Animal Center of Kharazmi University.To inject the drug into the CA1 region of the hippocampus, the animals were anesthetized with a mixture of ketamine and xylazine. After placing the rats in the stereotaxic device with two cannulas bilaterally in the CA1 region of the hippocampus (AP= - 3.8 mm, ML= ± 2.2 mm, DV= - 2.7 mm) is placed based on the paxinus atlas. Morris water maze is used to measure learning and spatial memory. This device is a circular black tank with a diameter of 150 cm and a depth of 60 cm. A hidden platform (10 cm diameter) is placed 1 cm below the water surface in the center of the target quadrant. In the training sessions,

parameters such as escape latency (time to find the hidden platform), distance traveled (path length to find the hidden platform) and swimming speed (swimming speed of the mouse in each training session) will be measured. In the test session, the time spent and the distance traveled in each quarter will be measured. To induce acute stress, the high open platform device will be used, which is a circular high platform with a diameter of 20 cm and a height of 100 cm. In this test, the animals are placed on EP for 30 minutes. EP has no transparent walls.

Results : To investigate the difference between the groups, statistical tests of two-way and one-way analysis of variance, t-test and Tukey were used in SPSS software.

Conclusion : The functional interaction of nitric oxide system and nicotinic cholinergic systems has a protective and improving effect in reducing disorders caused by acute stress on spatial memory.

Keywords : nitric oxide; nicotinic cholinergic systems; acute stress; spatial memory

Count: 175
Abstract ID: 317
subject: Emotion, Motivation
and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

What is the Link between Mental Imagery and Stress: A Pharmacological Study

Submission Author: Maryam Amir

Maryam Amir[1], Tara Rezapour[2], Reza Rostami[3], AbdolHossein Vahabie[4]

1. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
3. Department of Psychology, Faculty of Psychology and Education, University of Tehran, Tehran, Iran,
4. Department of Psychology, Faculty of Psychology and Education, University of Tehran, Tehran, Iran,

Background and Aim : Visual mental imagery (VMI), or seeing with the mind's eye, is a form of cognitive ability that generates internal images in the absence of stimulus in the real world. Exiting studies indicate an increasing interest in studying VMI in relation to emotionally driven factors such as stress. This study is aimed to investigate the role of stress in the sensory strength of mental imagery using a pharmacological intervention.

Methods : In this randomized, double-blind, placebo-controlled, between-subject design, participants were randomly assigned to one of three groups; (1) receiving a single dose of 20 mg Yohimbine (stress-induced condition, n = 13), (2) a single dose of 40 mg Propranolol (stress-reduced condition, n=12), or (3) control (sugar pills, n=10). The sensory strength of mental imagery was assessed using binocular rivalry task, before and after a placebo or a single dose of either yohimbine or propranolol given 7 days apart. Moreover, blood pressure and heart rate were monitored throughout the study.

Results : A paired-sample t-test was conducted to compare the priming effect in the stress-induced condition (after - before Yohimbine administration). There was a significant difference in the scores between after (M=25 ±3.65) and before (M=21.92 ±4.29) administration (t=-4.03 p = 0.001). These results suggest that the sensory strength of mental imagery could be increased under the stress-induced condition, while under stress-reduced condition the scores did not change significantly from before to after Propranolol administration (t=0.27, p = 0.79).

Conclusion : Overall, it can be assumed that as the level of stress increases, so does the sensory strength of mental imagery. Considering that mental imagery can play an important role in psychiatric disorders such as obsessive-compulsive disorder and post-traumatic stress disorder, our findings may help in improving the treatment process.

Keywords : Mental Imagery; Stress; Yohimbine; Propranolol

Count: 176
Abstract ID: 443
subject: Emotion, Motivation
and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Cognitive behavioral therapy for premenstrual syndrome : a systematic review

Submission Author: Mohaddeseh Hasanzadeh

Mohaddeseh Hasanzadeh[1]

1. Department of Nutrition, Islamic Azad University, Sarvestan Branch, Sarvestan, Fars, Iran; Nutritional Health Team (NHT), Universal Scientific Education and Research Network (USERN), Shiraz, Iran.

Background and Aim : A widespread problem in women of reproductive age is premenstrual syndrome (PMS). This problem affects their quality of life, anxiety, fatigue, appetite, and disability. Cognitive behavior therapy (CBT) is an approach that focuses on women's beliefs and responses to physical changes. There are some studies that investigated the effect of cognitive behavior therapy on PMS. In this review, actual data is collected and previous research findings are synthesized to determine whether CBT can decrease the severity of PMS symptoms and increase women's quality of life during the perimenopausal period.

Methods : Studies were identified through systematic searches in bibliographical databases (PubMed, Web of Science, Embase, the Cochrane library and Google Scholar). We included randomized control trial studies examining the effects of CBT on women's quality of life, their PMS severity, and their disability.

Results : According to the final sample included 18 psychosocial papers (n=1291). there was a significant difference between the pretest and posttest total mean scores of the intervention group that received psychoeducation ($P < 0.05$). Participants who are in the intervention groups had significantly low severity of PMS and disability than the control group.

Conclusion : CBT is a highly effective treatment for PMS symptoms. Accordingly, CBT should be available to women who report moderate-severe PMDs, and the results of this study can be used to develop public health policies. Psychotherapy should be considered as a treatment option for mild to moderate PMS in women.

Keywords : Cognitive-Behavioral Therapy, Premenstrual Syndrome, PMS, Quality of life

Count: 177
Abstract ID: 60
subject: Emotion, Motivation
and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

The relationship between evidence of depression and its severity with stroke incidence

Submission Author: Negar Bonyadi

Negar Bonyadi[1], Samad Shams Vahdati[2], Mobina Oladghaffari[3], Elham Afsar[4], Sama Rahnemayan[5], Nasrin Taghizadieh[6], Faezeh Googerdchi[7]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. MD, Emergency medicine research team, Imam Reza Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
4. MD, Emergency medicine research team, Imam Reza Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.
5. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
6. Emergency medicine research team, Imam Reza Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.
7. MD,Emergency medicine research team, Tabriz Islamic Azad University of Medical Science, Tabriz, Iran.

Background and Aim : Increasing evidence has emerged studying depressive symptoms as a prospective risk factor for stroke morbidity and mortality. Notwithstanding, how depression increases stroke risk is still unclear. Given that the relationship between depression and stroke has not been studied in our region and depression can be prevented and treated, we conducted a study to discuss this link, and also to investigate the effect of depression severity on stroke risk.

Methods : We conducted a cross-sectional study based on the Modified SAD PERSONS criteria, a representative for clinically important distress. Data were obtained from 126 patients who presented with acute stroke or had a history of stroke during the past year referred to the emergency department of Imam Reza Hospital from July to October 2019. Pearson correlation was used to measure the correlation between variables.

Results : There is a statistically significant link between the type of stroke and the severity of depression and the Modified SAD PERSONS score, but due to the low correlation coefficient, it is not clinically significant. The severity of the stroke and the score of Modified SAD PERSONS

have a statistically and clinically significant association. There is no clinically significant relationship between the severity of depression and the type of stroke or the incidence of stroke.

Conclusion : The results show that most patients with stroke had a history of depression, but the severity of depression was mild in most of the patients. A few patients have severe depression. There was no significant relationship between depression and the recurrence of stroke.

Keywords : depression; stroke; Modified SAD PERSONS score

Count: 178
Abstract ID: 473
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

Mindfulness and addiction: The Effectiveness of educating of Mindfulness on distress tolerance, resiliency and relapse prevention in drugs dependents: A mediating role of Self-Control

Submission Author: Younes Keihani far

Younes Keihani far[1], mehdi yaghobi[2]

1. Chamran Univercity
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aimed to The Effectiveness of educating of Mindfulness on distress tolerance, resiliency and relapse prevention in drugs dependents: A mediating role of Self-Control.

Methods : The present study was conducted in a quasi-experimental design in 2022. The statistical population of the study included all drugs dependents of Ahvaz MMT center. 32 people were selected and assigned into control and experimental groups. The experimental group received 8 sessions of mindfulness training and the control group did not receive any regular intervention. Participants in both groups completed the DTS-15, Conner-Davidson Resilience scale (CD-RIS) and the Brief Self-Control Scale on the pre-test, post-test, and follow-up (1 month after the end of the study). Data were analyzed by SPSS software using ANOVA with repeated measures.

Results : Results showed that the mean scores of distress tolerance, resiliency and self-control increased significantly in the experimental group compared to the control group at post-test and follow-up (P <0.001). In addition, mean scores of relapse decreased significantly in the experimental group compared to the control group at post-test and follow-up (P <0.001).

Conclusion : Mindfulness training can be one of the effective intervention in addictive behavior and it can be effective in managing drug dependency

Keywords : Resiliency, Mindfulness, Self-Control, distress tolerance, relapse.

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
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The effect of self-compassion training on craving and self-efficacy in female patients with methamphetamine dependence: a one-year follow-up

Submission Author: Nasrin Abdoli

Nasrin Abdoli[1], Mehdi Khodamoradi[2], Vahid Farnia[3], Serge Brand[4]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
3. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. Center for Affective, Stress and Sleep Disorders, Psychiatric Clinics of the University of Basel, University of Basel, Basel, Switzerland

Background and Aim : : Methamphetamine abuse is increasingly recognized as a serious, worldwide public health concern. The present study was conducted to assess the effect of self-compassion training on craving and self-efficacy in female patients with methamphetamine users and the rate of relapse over a one-year follow-upin 2017–2018 in the city of Kermanshah, Iran.

Methods : This study was a randomized, controlled, clinical trial. A total of 40 female patients diagnosed with methamphetamine dependency were randomly assigned either to self-compassion training and control groups. Both groups were assessed before and one month after the educational intervention using craving and self-efficacy questionnaires. The groups were followed-up in terms of methamphetaminemine use relapse one year after the intervention.

Results : After the intervention, the mean craving score decreased (51.82) while the mean self-efficacy score increased (28.82) in the trial group. In the one-year follow-up, ten participants (27.7%) from the trial group and 28 (75.7%) from the control group relapsed into methamphetamine users.

Conclusion : Given the present findings regarding the effect of self-compassion training on reduced craving and increased self-efficacy in female patients with methamphetamine dependence, the researchers recommend that self-compassion skills training be applied in drug rehabilitation centers and hospital wards to complement conventional therapies.

Keywords : Craving; cognitive disorder; methamphetamine; self-compassion

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Count: 180
Abstract ID: 412
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

The effect of intracerebroventricular injection of melatonin on the period of acquisition and expression and extinction and reinstatement of morphine conditioned place pereference in male rat: a behavi

Submission Author: ALi Siahposht khachaki

ALi Siahposht khachaki[1], ALi Siahposht- Khachaki[2], Shayan Gooran[3], davood farzin[4]

1. -
2. 1, * Department of Physiology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Medical Doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
4. Department of Pharmacology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Melatonin (N-acetyl-5-methoxytryptamine) is an indoleamine neurohormone, which is mainly synthesized and secreted by the pineal gland in all mammalian species. It has wide effects on the biological systems of the body. In addition to its proven function in regulating circadian rhythm and seasonal responses, melatonin is involved in some neuropsychopharmacological activities such as sedative/hypnotic, anticonvulsant and analgesic activity. The function of the reward system of the brain in reward and drug dependence is well known, therefore, in this study, we investigated the effects of intracerebroventricular injection of melatonin (MEL) during the period of acquisition, expression, extinction and return to morphine consumption again

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 shutdown phase and returned to morphine consumption again. During the silence period, half an hour before taking the conditioning test, he received different doses of melatonin (25, 50 and 100 μg/kg of body weight) intracerebroventricularly and on the day of returning to use 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 enzymatic work.

Results : Our findings showed that daily intracerebroventricular (ICV) injection of melatonin in doses of 50.25 and 100 micrograms caused a significant decrease in the period of acquisition, expression, extinction and return to re-use compared to the control group (P<0.001).). Of course, the effects were more significant in doses of 25 and 50 micrograms. In the groups treated with melatonin, 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 melatonin can be effective in the period of acquisition, expression, extinction and reinstatement of morphine and possibly useful in the formation of the basis of addiction

Keywords : : Melatonin, acquisition, expression, morphine, rat

Count: 181
Abstract ID: 104
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

The effect of intraperitoneally injection of hesperidin on the extinction and reinstatement following morphine induce conditioning place preference in male rat: a behavioral and biochemical study

Submission Author: Ali Abdolkarimi

Ali Abdolkarimi[1], Nima Rezaie[2], Ali Siahposht-Khachaki[3], Ashcan Fateri [4], Davood Farzin [5]

1. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
2. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
3. Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Pharmacy Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
5. Department of pharmacology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : A reward is a kind of response to a stimulus that creates pleasure. Natural substances such as drinks and foods, electrical stimulation and various drugs can induce the reward process in the brain. Mesocorticolimbic dopamine system including prefrontal cortex, nucleus accumbens, hippocampus and ventral tegmental area are involved in reward processes and drug dependence. Hesperidin is a natural flavonoid found in high concentrations in citrus fruits. It has neuron protection, antioxidant, anti-inflammatory and anti-cancer properties. The function of the reward system of the brain in reward and drug addiction is well known, therefore, in this study, we investigated the effects of intraperitoneal injection of hesperidin (HP) on the stages of extinction and reinstatement of conditioning with morphine.

Methods : During the conditioning period, the animals received morphine at a dose of 5 mg/kg body weight for three days. On the fifth day of the expression period, they entered the extinction period and reinstatement morphine CPP. During the extinction period, half an hour before taking the conditioning test, he received different doses of hesperidin (10, 20 and 40 mg/kg of body weight) intraperitoneally, and on the day of reinstatement to use, after taking a dose of morphine with a dose of 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 biochemical assay.

Results : Our findings showed that daily intracerebroventricular injection of hesperidin at doses of 10, 20 and 40 mg caused a significant reduction in the extinction period and reinstatement period in compared to the control group ($P < 0.001$). Of course, at doses of 20 and 40 mg, the effects were more pronounced. In the groups treated with hesperidin, the amount of c-Fos in the nucleus accumbens was altered so that the amount of c-Fos was significantly reduced in a dose-dependent manner ($P < 0.001$).

Conclusion : These findings suggest that hesperidin is effective in the period of extinction and reinstatement of morphine conditioning and may be useful in preventing the formation of addiction.

Keywords : Hesperidin; Reward; Extinction; Reinstatement; Morphine

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GABAA receptors of lateral habenula are involved in the expression phase of morphine-induced CPP

Submission Author: Elahe Amohashemi

Hojjatallah Alaei[1], Parham Reisi[2], Elahe Amohashemi[3]

1. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
3. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : The lateral habenula (LHb), known as an epithalamic structure, play a major role in response to aversive stimuli and negative emotional states. The main role of Gamma-aminobutyric acid-A receptor (GABAARs) in the reward system has been identified. However, the role of activation of these receptors in the LHb on the expression phase of morphine-induced conditioned place preference (CPP) remains unknown. In this research, the effects of intra-LHb microinjection of GABAAR antagonist and agonist (bilaterally) in the expression phase of CPP were investigated

Methods : In this study morphine subcutaneously, during 3-day conditioning phase, in male rats was used. Muscimol and bicuculline, bilaterally, microinjected in to the LHb, 5 min before testing session, to determine effect agents on the expression phase CPP (a five-day paradigm).

Results : Morphine causes CPP in a dose-dependent manner. Activation of GABAAR in LHb using high doses of GABAAR agonists, muscimol, and morphine (5 mg/kg, effective dose) significantly increased the CPP expression phase. While low doses of muscimol had no significant effect on morphine reward. On the other hand, blockade of GABAAR using GABAAR antagonist bicuculline failed to affect CPP scores at this stage. Microinjection of bicuculline reduced locomotor activity in the testing session. While the agonist had no significant effect on locomotion.

Conclusion : : These results suggest a possible role for GABAARs in LHb in the CPP expression phase. The findings of this study also suggest that muscimol may affect CPP in a dose-dependent manner. On the other hand, bicuculline probably had no effect on the expression phase due to movement impairment.

Keywords : CPP, Lateral habenula, GABAA receptors agonist and antagonist, expression phase of CPP

Count: 183
Abstract ID: 340
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

Combining fMRI and Behavioral Measures to Validate Cannabis Cue Database

Submission Author: Zahra Hamidein

Zahra Hamidein[1], Tara Rezapour[2], Hamed Ekhtiari[3], Peyman Ghobadi Azbari[4], Neda Mohammad[5], Parnian Rafei[6], Mohsen Ebrahimi[7]

1. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
3. Department of Psychiatry, University of Minnesota, Minneapolis, MN, USA
4. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
5. Department of Psychology, University of Tehran, Tehran, Iran
6. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
7. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Craving as a driving motive for drug-seeking and taking behaviors is a dynamic emotional-motivational response emerged in part to drug-related cues. To induce craving in a laboratory setting, it is common to apply the drug cue reactivity (DCR) paradigm to study both neural and behavioral responses to drug cues. The present study used functional magnetic resonance imaging (fMRI) and behavioral data to provide a set of validated pictorial cues for cannabis and neutral images.

Methods : 110 cannabis-related images were selected across cannabis flowers and powder, cannabis use methods, and paraphernalia categories cannabis use was asked to rate the selected images for craving, valence, and arousal using the visual analog scale and self-assessment Manikin. Using fMRI, the neural mechanisms underlying the cannabis cue-reactivity were investigated at the whole-brain level and within Brainnetome atlas areas in a subgroup of 31 cannabis users.

Results : The selected cannabis-related images (n = 110) received significantly higher craving (t = 6.56; p<0.001) and arousal (t = 17.46; p<0.001) ratings compared to the neutral ones (n = 30). Fifty regular cannabis users (19.9 ± 4.8 years; 10 females and 40 males) with at least a one-year

history of. Investigating blood oxygenation level-dependent (BOLD) responses to cannabis compared with neutral cues yielded significant activations in the inferior/medial frontal gyrus, fusiform gyrus, parahippocampal gyrus, orbital gyrus, postcentral gyrus, insula, precuneus, superior/middle temporal gyrus, and cerebellar tonsil.

Conclusion : This study provides a resource of ecologically validated cannabis-related images that is useful for studies applying DCR as a means of interventions or assessments for cannabis users.

Keywords : fMRI, cannabis, cue-reactivity, craving, valence, arousal

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 184
Abstract ID: 141
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

اثر تحریک الکتریکی با فرکانس پایین در هیپوکامپ، بر شاخص‌های رفتار حرکتی و تعادلی در موش‌های صحرایی نر بالغ نژاد ویستار

Submission Author: Reza Moghaddasi

Reza Moghaddasi[1], Ahmad Ali Moazedi[2], Zohreh Ghotbeddin[3]

1. Department of Biology, Faculty of science, Shahid Chamran University of Ahvaz, Ahvaz, Iran
2. Department of Biology, Faculty of science, Shahid Chamran University of Ahvaz, Ahvaz, Iran
3. Department of Basic Sciences, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

Background and Aim : Today, the use of low frequency electrical stimulation to treat neurological diseases or improve cognitive and motor functions is increasing rapidly. Therefore, in this study, the effects of low frequency electrical stimulation on motor and balance behavior of adult male Wistar rats are investigated.

Methods : This is an experimental study. Twenty adult male rats were randomly divided into 2 groups: Control: This group underwent surgery only and was prepared for behavioral tests after a recovery period. LFS group: Rats were threshold after recovery and received low frequency electrical stimulation for 6 days. This type of stimulation was applied in 4 packs at 5 minute intervals. Each packet contains 200 square waves of two phases, each pulse of which is 0.1 millisecond and its frequency is 1 Hz. Animal movement and balance indices were recorded by open field and rotating rod devices. Behavioral data analysis was performed using analysis of variance and Kruskal-Wallis tests.

Results : The results of statistical analysis showed that the application of LFS did not affect the motor variables and balance in the control and LFS groups ($p > 0.05$). The mean retention time on the rotating rod was longer in the SHM group than in the LFS group ($p > 0.05$). Also, the average number of crossings, bipedal standing and self-treatment was lower in SHM and LFS groups ($p > 0.05$).

Conclusion : : In general, LFS application reduces balance and increases movement in rats. However, its effect is not statistically significant.

Keywords : Low Frequency Electrical Stimulation, Rat, Rotarod, Open Feild

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 185
Abstract ID: 102
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

State-dependent learning and memory: The role of nicotine and ethanol

Submission Author: Saba Niknamfar

Saba Niknamfar[1], Rahaleh rafaiee[2], , Hamed Ghazvini [3]

1. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : State-dependent learning or state-dependent memory describes a special phenomenon: if memory is formed when the subject is under the effect of specified condition or drug, it will be thereafter recalled most efficiently only when the same condition or drug is reestablished. State-dependent learning is a complicated phenomenon and its underlying mechanisms have not yet been fully investigated. Drugs of abuse such as nicotine and ethanol are one of the most important modulators of state-dependent learning. This review study aimed to discuss state-dependent memory and the role of nicotine and ethanol in the modulation of this phenomenon.

Methods : ...

Results : It was noted that nicotine or ethanol by itself, induces both improvement and impairment effects on memory function and its mechanisms are complicated. It was also noted that co-administration of drugs of abuse leads to cross state-dependent learning and memory, that is a very complicated physiological phenomenon.

Conclusion : Furthermore, it was declared that different neurotransmitter systems in the brain are the main modulators of state-dependent learning. It seems that cross state-dependent learning and memory induced by drugs of abuse may be related to the interaction effects between different neurotransmitter systems in memory-related brain regions including the hippocampus and the amygdala.

Keywords : State-dependent learning; State-dependent memory; Nicotine; Ethanol; Cross state-dependent learning; Neurotransmitters

Count: 186
Abstract ID: 396
subject: Emotion, Motivation
and Behavior: Reward and the Brain
Presentation Type: Poster

Involvement of Basolateral Amygdala Dopamine D1 Receptors in the Acquisition and Expression of Morphine-Induced Place Preference in Rats

Submission Author: Zahra Rezae

Zahra Rezae[1], Parham Reisi[2]

1. Hojjatallah Alaei
2. Parham Reisi

Background and Aim : In the present study, the effects of intra-basolateral amygdala (BLA) blockade of dopamine D1 receptor on morphine-induced conditioned place preference (CPP) were investigated in male Wistar rats.

Methods : A 5-day CPP paradigm was used. Morphine was injected subsequently at effective (5 mg/kg) and ineffective (0.5 mg/kg) doses. SCH 23390 (0.5– μg/rat), as a selective D1 receptor antagonist, was microinjected bilaterally into the BLA.

Results : Effective dose of morphine induced a significant CPP, and increased the locomotor activity during the testing phase. The results showed that morphine-induced CPP was significantly suppressed by D1 receptors antagonist in BLA in the acquisition phase and caused an aversion even at high doses. The antagonist also significantly prevented CPP expression. Morphine increased the motor activity, but the D1 receptors blockade, significantly reduced it.

Conclusion : The findings of this study suggest a possible role for BLA dopamine D1 receptors in reward responses in morphine dependency.

Keywords : Addiction, basolateral amygdala, dopamine-D1 receptor, morphine

Count: 187
Abstract ID: 434
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

Lidocaine injection into lateral habenula nucleus reduced morphine self-administration in male rat

Submission Author: Farahnaz Ataei

Farahnaz Ataei[1], hojjatAllah Alaei [2]

1. Department of Biology, Kazerun Branch, Islamic Azad University, Kazerun, Iran
2. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Addiction is one of the critical problems of public health. Evidence suggests that the lateral habenula (LHb) is a brain structure that plays an important role in sleep control, response to negative emotional states, and stress. The present study was conducted with the aim of investigating the effect of lidocaine injection in the lateral habenula on the process of morphine addiction.

Methods : Animals were divided into 3 groups: saline, morphine (5 mg/ml), and lidocaine (0.3 µl/rat) groups. The animals were anesthetized with ketamine (100 mg/kg) and xylazine (10 mg/kg) (i.p.). Following the recovery period, self-administration sessions were performed in 11 days, in which the number of active and passive lever pressing were measured. In addition, the number of self-infusions was recorded.

Results : Based on the results, the trend of active lever pressing in the morphine group was increased during the 6-11 days related to the saline group. While it was decreased in the lidocaine group related to morphine receiving animals. In addition, the result of self-administration demonstrated that number of infusions in the morphine group was higher than those in the saline group after the sixth day. In the other hand number of infusions was reduced in animals receiving lidocaine in comparison with the morphine group, suggesting that it may be lidocaine reduced release of neurotransmitters involved in morphine addiction.

Conclusion : The chemical lesion of the habenula accompanied with the concentration changes of some neurotransmitters such as serotonin, GABA, and dopamine may reduce morphine craving in addicted rats. However, further studies for determining the underlying molecular mechanisms are warranted.

Keywords : Addiction, Lateral habenula, Lidocaine, Morphine, Self-administration

Count: 188
Abstract ID: 463
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

The electrical stimulation of central nucleus of the amygdala in combination with dopamine receptor antagonist reduces the acquisition phase of morphine-induced conditioned place preference in male rat

Submission Author: Zahra Jokar

Zahra Jokar[1], HojjatAllah Alaei[2]

1. Department of Biology, Kazerun Branch, Islamic Azad University, Kazerun, Iran
2. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : The central nucleus of the amygdala (CeA) is one of the most important areas involved in morphine reward effects. This study evaluated the effect of CeA electrical stimulation on morphine-conditioned place preference (CPP), before or after the bilateral injection of dopamine D1 receptor (DA D1) antagonist, SCH23390, in male Wistar rats.

Methods : Male Wistar rats underwent stereotaxic surgery. After a seven-day recovery period, morphine was subcutaneously injected at an effective dose of 5 mg/kg. Also, SCH23390 was bilaterally microinjected into CeA. In addition, CeA was stimulated with an intensity of 150 µA. Finally, the effects of electrical stimulation and SCH23390 on the acquisition phase of morphine-induced CPP were evaluated.

Results : The findings revealed that the injection of morphine at the dose of 5 mg/kg increased the time spent in the drug-paired compartment, significantly. In addition, the electrical stimulation with the intensity of 150 ?A had no effect on morphine-induced CPP, while the intra-CeA injection of SCH23390 in the combination with the electrical stimulation reduced the acquisition phase, significantly.

Conclusion : The study concluded that the synergic effects of electrical stimulation and the inhibition of dopamine receptors on morphine-induced CPP may be mediated through the dopaminergic system.

Keywords : Addiction; Central nucleus of the amygdala; Conditioned place preference; receptors, Dopamine D1; Electrical stimulation; Morphine

Count: 189
Abstract ID: 403
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Poster

The combination of aerobic exercise and Ziziphus jujuba Mill extract supplementation improve spatial and non-spatial memory induced by ethanol

Submission Author: Maha Masoudi

Maha Masoudi[1], Farimah Beheshti[2]

1. Department of Laboratory Sciences, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
2. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : In the present study we aimed to test whether treatment by exercise and Ziziphus jujuba Mill. (ZJ) extract could prevent ethanol-induced complications in rats using behavioral and biochemical methods.

Methods : Different groups of male rats received ethanol, ethanol+exercise (10 and 20 m/s), ethanol+ZJ extract, ethanol+exercise 20m/s+ZJ extract, and exercise 20m/s+ZJ extract alone, or saline during 5 weeks and then learning and memory functions were assessed by MWM and PA tests. Finally, mice were sacrificed for the measurement of biochemical factors

Results : Results indicated that, adolescent ethanol intake impairs learning and memory function through exacerbation of oxidative stress and exercise 20m/s and ZJ extract treatment improves these complications by re-establishment of oxidant/anti-oxidant balance in CNS. Moreover, we found that exercise 20m/s and ZJ extract prevents ethanol-induced enhancement of interleukin-6 (IL-6).

Conclusion : In conclusion, it seems that moderate exercise and ZJ extract supplementation could be used as an effective therapeutic strategy to prevent learning and memory defects induced by chronic alcohol intake.

Keywords : ethanol,Ziziphus jujuba Mill , learning, memory, oxidative stress

Count: 190
Abstract ID: 397
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Inducible nitric oxide synthase plays a role in depression- and anxiety-like behaviors chronically induced by lipopolysaccharide in rats

Submission Author: Ali Rahimi

Ali Rahimi[1], Mohammad Amin Rahmani[2], Farimah Beheshti[3]

1. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
2. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran
3. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran

Background and Aim : The effects of aminoguanidine (AG) were investigated in a rat model of lipopolysaccharide (LPS)-induced anxiety- and depression-like behaviors.

Methods : The animals were allocated to five groups (n = 10 in each) and treated by: (1) saline as a control group, (2) LPS 1 mg/kg injected two hours before behavioral tests, (3-5) AG 50, 100 or 150 mg/kg before LPS. The open-field test (OFT), elevated plus maze test (EPT), and forced swimming (FS) tests were performed. The brains and blood were then collected to examine oxidative stress and inflammation criteria.

Results : LPS increased the immobility while decreased the active time in the FS test. In EPT, LPS decreased the time spent in the open arms, whereas it increased the time spent in the closed arms. In OFT, LPS decreased the time spent in the central zone compared with the controls. A higher dose of selenium improved the performances of the rats in behavioral tests. LPS injection also increased malondialdehyde (MDA) while it decreased thiol, superoxide dismutase (SOD), and catalase. LPS also increased interleukin (IL)-6 and tumor necrosis factor-alpha (TNF-α), but decreased IL-10 in the LPS group. AG protected the brain from inflammation and oxidative damage

Conclusion : It was demonstrated that AG improves the behaviors of depression and anxiety in a rat model of LPS-induced anxiety- and depression-like behaviors. Moreover, the effects of AG were accompanied by improved inflammation and oxidative damage biomarkers in brain tissues.

Keywords : Aminoguanidine; Depression; Anxiety; Lipopolysaccharide; Oxidative stress; Neuroinflammation

Count: 191
Abstract ID: 393
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Poster

N-acetyl cysteine attenuated learning and cognition impairment associated with hypothyroidism in adolescent rats

Submission Author: Mohammadamin Rahmani

Mohammadamin Rahmani[1], Ali Rahimi[2], Farimah Beheshti[3]

1. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
3. Departments of Physiology, School of Paramedical Sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : We assumed n-acetyl cysteine(AC) might improve cognitive function in adolescent rats with hypothyroidism probably by reducing brain tissue oxidative stress, Interleukin-6(IL-6), nitrite levels, and increasing brain-derived neurotrophic factor (BDNF) as a protective factor for the brain.

Methods : Sixty adolescent rats were divided into the following groups:(1)vehicle;(2) propylthiouracil(PTU)-induced hypothyroidism;(3-5)Hypothyroid rats were treated intraperitoneally (IP) with different doses of AC (50, 100, and 150 mg/kg/day) for a period of six weeks. (6)Normal rats treated with high dose of AC (150mg/kg/day, for six weeks). Behaviour and cognitive performance of rats and biochemical blood analysis were studied for all groups.

Results : In the Morris water maze (MWM) test, AC significantly reduced both the time to find the hidden platform and the distance travelled as compared to non-treated hypothyroid rats. In the passive avoidance(PA) test, the latency of entering the dark chamber was significantly increased by AC, whereas decreased the time spent in the darkroom of chamber when compared to the hypothyroid rats. In biochemical results, AC reduced both malondialdehyde(MDA) content and nitrite while increased the thiol content, catalase(CAT) and superoxide dismutase(SOD) enzymes activity in both the cortex and the hippocampus, and increased the levels of hippocampal BDNF in the hypothyroid rats, while decreased the level of IL-6 in rat hippocampal region.

Conclusion : Therefore, based on the results, the beneficial effects of AC on cognitive impairment in adolescent hypothyroid rats are probably related to its anti-oxidant properties and notable improvement in BDNF levels.

Keywords : Hypothyroidism; N-acetyl cysteine; Learning and Memory; BDNF; Oxidative stress, Interleukin-6

Count: 192
Abstract ID: 394
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Effects of Ocimum basilicum L. extract on hippocampal oxidative stress, inflammation and BDNF expression in amnesic aged rats

Submission Author: Mobina Mehdizade

Mobina Mehdizade[1], Maryam Mohammadi[2], Farimah Beheshti[3]

1. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
3. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : The present study was conducted to investigate the effects of Ocimum basilicum L. (OB) extract on learning and memory impairment in aged rats.

Methods : Male rats were divided into the following experimental groups: Group 1 (control): including 2 months old rats, Group 2 (aged) including 2 years old rats, Groups 3-5 (aged-OB): including 2 years old rats received 50, 100 and 150 mg/kg OB for 8 weeks by oral gavage.

Results : Aging increased the delay to find the platform, however, decreased the time spent in the target quadrant when tested by Morris water maze (MWM). Aging also reduced the latency to enter the dark chamber in passive avoidance (PA) test compared to the control group. Moreover, interleukin-6 (IL-6) and malondialdehyde (MDA) levels were raised in the hippocampus and cortex of aged rats. In contrast, thiol level and enzymatic activity of superoxide dismutase (SOD) and catalase (CAT) significantly reduced. In addition, aging significantly reduced BDNF expression. Finally, OB administration reversed the mentioned effects.

Conclusion : The current research showed that OB administration improves learning/memory impairment induced by aging. It also found that this plant extract protects the brain tissues from oxidative damage and neuroinflammation.

Keywords : Ocimum basilicum L.; Memory; Aging; Oxidative damage; Neuroinflammation; BDNF

Count: 193
Abstract ID: 108
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Poster

The effect of lemon balm extract treatment on high-fat diet induced anxiety- and depressive-like behaviours in rats

Submission Author: Kazem Hatami

Kazem Hatami[1], Majid hassanpour-ezatti[2]

1. Ph.D student of Physiology. Dept.of Biology. Faculty of science, Shahed university,Tehran, Iran
2. Ph.D of Physiology. Dept.of Biology. Faculty of science, Shahed university,Tehran, Iran

Background and Aim : It is known that obesity resulted from high fat diet (HFD) is a contributing factor to several physical and mental diseases. In this study, we examined the effect of hydroalcoholic extract of Melissa officinalis (lemon balm) (50, 100 and 150 mg/kg) and citalopram (positive control) in HFD rats on behavioral parameters by the sucrose preference test (SPT), and elevated plus maze (EPM) and on secretion of neurotropic factors alterations by analysis of the serum brain derived neurotropic factor (BDNF).

Methods : Sixty male Wistar rats (210- 250 g) were assigned to six groups: SD, HFD, SD plus M. officinalis extract (50, 100 and 150 mg/kg, i.p.), HFD plus M. officinalis extract, SD plus CIT (10 mg/kg, i.p.), and HFD plus CIT. Animals were allowed free access to high-fat chow for 5 weeks. Then, CA, and CIT or vehicles were injected intraperitoneally (IP) daily for two weeks. The body weight, sucrose preference test (SPT), and elevated plus maze (EPM) behaviour and serum lipid profile and BDNF levels were measured at the end of experiment.

Results : HFD rats showed anxiety- and depressive-like behaviors concomitant with increased weight gain and increased plasma lipid profile, and a decrease in the serum BDNF. Treatment with CA and CIT improved behavioral deficit induced by HFD in SPT and EPM and prevents from decrease of serum BDNF level. Moreover, the daily administrations of CA and CIT have beneficial effects on the mood function in normal rats.

Conclusion : Taking together, our findings demonstrate the anti-obesity, anti-anxiety and anti-depressive effects of M. Officinalis extract by enhancing the serum BDNF in the HFD rat model of cognitive deficits.

Keywords : Melissa officinalis; high fat diet; depression; anxiety; BDNF

Count: 194
Abstract ID: 181
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Acute doses of methamphetamine increases pain sensation and anxiety in rats

Submission Author: Hossain Mohammad Pour Kargar

Hossain Mohammad Pour Kargar[1], Hossein azizi[2], Maryam dasturani[3]

1. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
2. Departmen of Physiology, Faculty of medical science, Tarbiat Modares University, Tehran, Iran
3. Faculty of Pharmacy, Islamic Azad University, Damghan Branch, Damghan, Iran

Background and Aim : Methamphetamine (Met) is a potent addictive psychostimulant which diffuses easily through the blood–brain barrier and affects neuronal terminals in the brain. High doses of Met induce neurotoxicity which causes considerable medical consequences, such as Parkinson's disease, seizures, depression and anxiety. In this study, effect of high methamphetamine doses on pain sensation was investigated.

Methods : 28 male rats were allocated to 2 groups: 1) control and 2) methamphetamine group. Rats received acute doses of methamphetamine repeatedly (2×20 mg/kg, 2 hour interval). Tail flick test for evaluation of pain perception and open field test for evaluation of anxiety, were used. Comparison of experimental groups was performed by Student's t-test.

Results : Statistical analysis showed that injection of methamphetamine induced hyperalgesia and reduced tail flick latency ($P<0.001$) significantly. Furthermore, methamphetamine increased locomotor activity ($P<0.006$), corner zone entering ($P<0.002$,) and decreased spending time in central zone ($P<0.002$,), central zone entering ($P<0.001$) and rearing ($P<0.03$) significantly.

Conclusion : The present study showed that acute methamphetamine exposure increased pain and anxiety in rats. As the effects of methamphetamine in CNS are majorly dependent on interaction with dopamine, norepinephrine and serotonin systems, it is possible that acute exposure to methamphetamine may affects nociceptive systems and change pain perception in animals. It has been suggested that oxidative stress are the most contributing factors which involve in the methamphetamine neurotoxicity.

Keywords : Methamphetamine, Pain, Anxiety

Count: 195
Abstract ID: 110
subject: Emotion, Motivation
and Behavior: Behavioral Pharmacology
Presentation Type: Poster

The effect of limonene on learning and memory affected by depression caused by food deprivation

Submission Author: Elham Bakhtiyari

Elham Bakhtiyari[1], Kazem hatami[2]

1. Ph.D candidate in Neuroscience, SATIM, Tehran University of Medical Sciences.
2. Ph.D candidate of Physiology. Dept.of Biology. Faculty of science, Shahed university,Tehran, Iran

Background and Aim : Depression is a mental disorder and has wide effects on a person. One of these effects is memory and learning defects. Deprivation of food causes depression in mice and subsequently, memory and learning pathways are disturbed. Limonene is a type of terpene and a plant compound that has antidepressant effects and has been able to reduce depression in studied mice. Since chemical drugs have side effects, herbal compounds can be used as alternatives.

Methods : In this research, 21 male rats were used in (1) control, (2) food-deprived, and (3) food-deprived and limonene-receiving groups. After the deprivation period (12 hours a day for 4 weeks), the state of memory and learning was evaluated by Morris water maze.

Results : The results indicated that the rats receiving limonene had better memory than the second group and limonene was able to significantly improve memory in rats deprived of food.

Conclusion : It can be said that limonene has been able to improve memory with its anti-depressant effect by affecting the HPA system and reducing the level of corticosterone in the hippocampus and frontal cortex, as well as increasing the level of BDNF in the hippocampus.

Keywords : Limonene; Depression; Learning and memory; Morris water maze

Count: 196
Abstract ID: 488
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

Evaluation of the effectiveness of mindfulness on primary bully student's anger: mediating role of self-control

Submission Author: Najmeh Darroudi

Najmeh Darroudi[1]

1. Khayam university of Mashhad

Background and Aim : The aim of this study was to evaluate the effectiveness of mindfulness on primary bully student's

Methods : The present study is a Semi-experimental study that was performed on students in Mashhad. After referring to a psychiatrist or clinical psychologist for initial diagnosis of Bullying based on DSM-5, sampling was performed. Using simple random sampling method, 17 female bully students were selected from 4 primary schools in Mashhad. Also, in terms of age and sex, 17 normal children were the same. Students first completed a demographic information questionnaire. The researcher then performed self-control scale, and Spielberger Anger Scale. The data were analyzed using descriptive and inferential methods using SPSS-21 program.

Results : The results showed that is effective in reducing anger of students through increasing self-control

Conclusion : The results show that mindfulness increasing self-control and reducing anger in bully students. Findings show that the mindfulness for children has the ability to control anger and emotion regulation compared to healthy counterparts. Therefore, it can be a good intervention for evaluation in this group.

Keywords : mindfulness, anger, Student, Bullying, self-control

Count: 197
Abstract ID: 493
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

the effectiveness of psychomotor intervention on working memory, executive functions and attention

Submission Author: Fereshte Aramide

Fereshte Aramide[1], mehdi yaghobi[2]

1. Azad university
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The aimed of this study was the effectiveness of psychomotor intervention on working memory,

Methods : The present study was conducted in a quasi-experimental design in 2022. The statistical population of the study included all the students of the third grade of primary school in Ahvaz. 28 people were selected and assigned into control and experimental groups. The experimental group received 8 sessions of movement training and the control group did not receive any regular intervention. Participants in both groups completed the Coolidge's Executive Performance Questionnaire and attention Questionnaire and Damine and Carpenter working memory questionnaire on the pre-test, post-test, and follow-up (1 month after the end of the study). Data were analyzed by SPSS software using ANOVA with repeated measures.

Results : Results showed that the mean scores of working memory, executive functions and attention increased significantly in the experimental group compared to the control group at post-test and follow-up (P <0.001).

Conclusion : psychomotor intervention can be one of the effective intervention in school and it can be effective in managing academic problem and improving students function.

Keywords : working memory, executive functions, attention, students, ADHD.

Count: 198
Abstract ID: 80
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

Methamphetamine and REM sleep deprivation may exert age-dependent effects on locomotor activity, anxiety-like behavior, and spatial memory

Submission Author: Mehdi Khodamoradi

Mehdi Khodamoradi[1], Aazam Brimvandi[2], Seyed Ershad Nedaei[3]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Department of Physiology, Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran
3. Department of Physiology, Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : Drug addiction may result in sleep problems. On the other hand, sleep deprivation is known as one of the important risk factors for relapse to drug abuse as sleep deprivation mimics the effects of psychostimulants on dopaminergic system. Moreover, aging may affect sleep and drug addiction. This study, therefore, set out to assess the effects of REM sleep deprivation (RSD) and methamphetamine (METH), as a potent addictive psychostimulant, on locomotor activity, anxiety-like behavior, and spatial memory in adult and adolescent rats.

Methods : Adult and adolescent male Wistar rats were given a neurotoxic METH regimen (four injections of 6 mg/kg, s.c, at 2 h intervals). Five days later, the animals underwent a 48-h RSD episode using the multiple platforms method. They were then examined using the open field (OF), elevated plus maze (EPM), and Y-maze tasks, in separate groups.

Results : RSD and METH showed synergistic effects in increasing locomotion in the adult, but not in adolescent, rats in the OF task. In the EPM task, the adolescent animals revealed no significant differences between the groups; however, co-administration of RSD and METH increased the time spent in the open arms in the adult rats. Finally, adult rats showed impaired; however, adolescent rats revealed improved spatial working memory in the Y-maze task following RSD and METH co-administration.

Conclusion : It would seem to suggest that co-administration of RSD and METH may result in age-dependent effects. In adult rats, hyperlocomotion and impaired spatial working memory, along

with risk-taking behavior, were observed following RSD and METH co-administration, whereas the adolescent rats showed only improved spatial working memory. These findings provide new insights into the neurobiology of addiction, especially effects of age and sleep deprivation.

Keywords : Methamphetamine; REM sleep deprivation; age; anxiety; locomotor activity; spatial memory

Count: 199
Abstract ID: 485
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

Relationship between mindfulness, executive function and working memory capacity in elementary students at Qom: mediating role of attentional function

Submission Author: Mojtaba Imany

Mojtaba Imany[1], najmeh darrodi[2]

1. Arak university
2. Khayiam university of mashhad

Background and Aim : The aim of this study was to evaluation Relationship between mindfulness, attentional function, executive function and working memory capacity in elementary students at Qom: mediating role of attentional function.

Methods : The present study is a Semi-experimental study that was performed on students in Qom. 196 students were selected from schools in Qom. Participants first completed a demographic information questionnaire. The researcher then performed Children's Mindfulness Scale, Coolidge Neurological Test and Connors Attention Questionnaire. The data were analyzed using descriptive and inferential methods using SPSS-21 program.

Results : The results showed that the levels of mindfulness related with executive function, attentional

Conclusion : According to the results obtained in this research, it is suggested that interventions to strengthen the mindfulness that promoting cognitive and emotional performance of primary school students, will be plan and do in schools.

Keywords : mindfulness, attention, emotion regulation, working memory.

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February 13-14, 2023   **Tehran, Iran**

Comparing the effectiveness of teaching mindfulness skills and neurofeedback, impulsivity and executive functioning of students

Submission Author: Leila Imani

Leila Imani[1], mehdi yaghobi[2]

1. Azad university
2. Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran

Background and Aim : The purpose of the present study was to compare the effectiveness of neurofeedback training and mindfulness in i the executive function of planning and impulsivity student.

Methods : : the method of the current research was semi-experimental with a pre-test and post-test design and follow-up with a control group. The statistical population of the present study is 150 students. For this purpose, 60 students were randomly replaced in three groups of 20 people. The first group (neurofeedback) received 16 sessions, two sessions of individual training a week, and the second group (mindfulness), 8 sessions of group training (1 session per week) and the third group (control) did not receive any intervention. The research tool included the London Tower planning computer test. Data were analyzed using repeated measures analysis of variance.

Results : The average of the two experimental groups was significantly different from the control group in the components of test time, delay time for planning, errors and points in the post-test stages, and follow-up, while the average of the experimental groups did not differ significantly.

Conclusion : It can be concluded that both neurofeedback and mindfulness training equally improve the executive function of planning in student, each of them can improve the executive function of planning in their own position and reduce impulsivity.

Keywords : Neurofeedback, mindfulness, executive function, impulsivity, student.

The effect of eight weeks of movement intervention on selective attention and academic progress of students with academic failure

Submission Author: Rez van Rezai

Rez van Rezai[1]

1. Azad university

Background and Aim : The aimed of this study was the effect of eight weeks of movement intervention on selective attention and academic progress of students with academic failure.

Methods : The present study was conducted in a quasi-experimental design in 2022. The statistical population of the study included all the students of the third grade of primary school in Neishabur city. 36 people were selected and assigned into control and experimental groups. The experimental group received 8 sessions of movement training and the control group did not receive any regular intervention. Participants in both groups completed the Broninx-Ozertsky motor skills test, attention test and academic achievement test were made by the researcher on the pre-test, post-test, and follow-up (1 month after the end of the study). Data were analyzed by SPSS software using ANOVA with repeated measures.

Results : Results showed that the mean scores of motor skills, academic achievement and selective attention increased significantly in the experimental group compared to the control group at post-test and follow-up (P <0.001).

Conclusion : movement intervention can be one of the effective intervention in school and it can be effective in managing academic problem and improving health.

Keywords : movement intervention, selective attention, academic progress , students.

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Impulsive, Depressed, and Anxious Individuals are more Prone to Fail in Self-monitoring: COGNO Life Study

Submission Author: Nazanin Mohammadi manesh

Nazanin Mohammadi manesh[1], Tara rezapour[2], Hamed ekhtiari[3]

1. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
3. Department of Psychiatry, University of Minnesota, Minneapolis, MN, USA

Background and Aim : Background: Self-monitoring is a well-studied technique to improve self-regulation capacity, however, there are various barriers to successful experience of self-monitoring which have been understudied in healthy adults. Aims: To identify predictors the failure of a 28-days course of self-monitoring intervention, named "COGNO Life", that was developed applying the Science of Behavior Change (SOBC) approach.

Methods : The current study recruited 82 volunteer participants (51.2%female; mean age=28.9±4.91) randomized to a four-weeks paper diary for self-monitoring program (COGNO Life) and control groups. COGNO Life group were instructed to daily record their goal-relevant behaviors and track their progress. Self-regulation was assessed at pre-test, and post-test to evaluate the efficacy of COGNO Life. Moreover, to identify the role of depression, social anxiety, and impulsivity as common psychopathological variables, we used the Beck Depression Inventory, Barratt Impulsiveness Scale, and Jerabek Social Anxiety Scale, respectively.

Results : We found no significant difference between both groups in terms of self-regulation scores (t= 3.24, p=0.07). Cox hazards regression analysis revealed that smokers were 1.5 times less likely to stay in self-monitoring intervention than non-smokers (Wald test= 4.50, p=0.03). Moreover, we found a significant role of impulsivity (wald test= -24.42, p=0.02) and its interaction with depression and social anxiety in predicting participant's engagement in self-monitoring intervention

Conclusion : Successful experience of self-monitoring in both dimensions of study adherence and engagement were significantly associated with psychopathological variables and smoking state in healthy adults. These findings suggest a specific focus on prerequisite of successful experience of self-monitoring and tailoring these interventions to overcome personal-driven barriers.

Keywords : Behavior Change, Self-regulation, Impulsivity, Depression, Anxiety, Self-monitoring, Adherence

Count: 203
Abstract ID: 483
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

Mindfulness and school: Effectiveness of Mindfulness training on anger and distress tolerance in student

Submission Author: Zahra Taherniya

Zahra Taherniya[1]

1. Khayam university of Mashhad

Background and Aim : The aim of this study was to evaluate the effectiveness of mindfulness training on anger and distress tolerance in student.

Methods : The present study is a Semi-experimental study that was performed on students in ahvaz. Using simple random sampling method, 30 boy students were selected from 4 schools in ahvaz. Also, were placed in 2 groups, including: experiment group and control group.15 student in experiment group and 15 students in control group. Participants first completed a demographic information questionnaire. The researcher then performed self-control scale, and Spielberger Anger Scale and DTS- 15 Scale (Simon & Gaher). The data were analyzed using descriptive and inferential methods using SPSS-21 program.

Results : The results showed that is effective in reducing anger and increase ¬distress tolerance of students

Conclusion : The results show that mindfulness increasing self-control and reducing anger in bully students. Findings show that the mindfulness for children has the ability to control anger and disaster managing compared to healthy counterparts. Therefore, it can be a good intervention for evaluation in this group.

Keywords : mindfulness, anger, Student, Bullying, self-control

Count: 204
Abstract ID: 480
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

Evaluation of the effectiveness of education of mindfulness skills on emotion regulation and attention in primary school children with ADHD

Submission Author: Ensiye Hemati farimani

Ensiye Hemati farimani[1]

1. Khayam university of Mashhad

Background and Aim : The aim of this study was to evaluate the effectiveness of education of mindfulness on emotion regulation and attention in primary school children with ADHD.

Methods : The present study is a descriptive-analytical study that was performed on students in Mashhad with ADHD. After referring to a psychiatrist or clinical psychologist for initial diagnosis of ADHD based on DSM-5, sampling was performed and Wexler test normative intelligence scores were examined in the academic record. Using simple random sampling method, 15 female students with ADHD were selected from 4 government centers for child in Mashhad. Also, in terms of age and sex, 15 normal children were the same. Students first completed a demographic information questionnaire. The researcher then performed version A of the Children's Daily Attention Test at standard time in a quiet, well-lit area for students. Accordingly, two groups with ADHD and healthy counterparts were compared in three areas of continuous attention, selective, control, and attention transfer.

Results : : The results show that the distribution of values of all variables except the dual task of sky search (stable attention) and the speed of counting organisms (attention transfer) in the Experimental group ADHD has a natural distribution (P> 0.05) selective attention (0 / P> 05) emotion regulation (0 / P> 05) shows a significant difference between the two groups.

Conclusion : The results show that children with ADHD perform much worse than healthy counterparts in all three areas. Findings show that the mindfulness for children has the ability to detect attention deficits and emotion regulation compared to healthy counterparts. Therefore, it can be a good tool for evaluation in this group.

Keywords : mindfulness, attention, Student, ADHD, emotion regulation

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Count: 205
Abstract ID: 490
subject: Emotion, Motivation
and Behavior: Motivation and Emotion
Presentation Type: Poster

The effectiveness of Self-Compassion training on resilience and quality of life in mothers of children with intellectual disability

Submission Author: Sima Khavandizadeh aghdam

Sima Khavandizadeh aghdam[1], Yalda Mahfouzi1[2], Manijeh Firoozi2[3]

1. Department of Midwifery, Ardabil branch, Islamic Azad university, Ardabil, Iran
2. M.Sc. student, Clinical Psychology, Aras International Campus, University of Tehr
3. . Invited Professor, Aras International Campus, Tehran University

Background and Aim : The purpose of this research is the effectiveness of self-compassion training on the resilience and quality of life of mothers with mentally retarded children. The current research is practical in terms of its purpose

Methods : The research method is experimental with a pre-test-post-test design in two groups. The statistical population of the research is mothers with mentally retarded children in Ardabil city in 1401. Sampling method is available. Among the qualified volunteers, 100 people entered the study and were randomly replaced in two groups of 50 people (self-compassion training and control). The self-compassion training group received eight 90-minute sessions. Standard questionnaires of resilience and quality of life were used to collect information. The data collected in the pre-test and post-test stages were analyzed by multivariate analysis of covariance using SPSS version 26 statistical software.

Results : The findings of the research showed that, therefore, it can be said that the main hypothesis is confirmed and that self-compassion training has a positive effect on the resilience and quality of life of mothers with mentally retarded children. Also, the results show that the first hypothesis is confirmed and self-compassion training has a positive effect on the dimensions of resilience of mothers with mentally retarded children. Finally, the second hypothesis is confirmed and self-compassion training has a positive effect on the dimensions of the quality of life of mothers with mentally retarded children.

Conclusion : Therefore, it can be concluded that self-compassion training improves the resilience and quality of life of mothers with mentally retarded children

Keywords : Mental Retardation,Quality Of Life,Resilience,Teaching Self-Compassion

Count: 206
Abstract ID: 428
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Neural Psychophysiological Mirror Impacts as the Mixed-Method for Brain Stimulating in DLPFC Both of the Left and Right sides of the Brain for Drug Resistant Migraine Patients; Evidence Based Report

Submission Author: Mohammadjavad Hoseinpourfard

Mohammadjavad Hoseinpourfard[1], Mohammadjavad Hoseinpourfard[2], Mohammadjavad Hoseinpourfard[3], Asgar Emamgholi [4], Asgar Emamgholi[5]

1. Department of Children and Adolescents Clinical Psychology, Roshdiyeh Higher Education Institute, Tabriz, Iran.
2. Department of Cognitive Neuroscience, Institute for Cognitive Science Studies, Tehran, Iran.
3. Neuroscience Research Center, Baqiyatallah university of Medical Sciences, Tehran, Iran.
4. Department of Tissue Engineering and Regenerative Medicine , Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences Tehran, Iran.
5. Neuroscience Research Center, Baqiyatallah university of Medical Sciences, Tehran, Iran.

Background and Aim : Many studies have focused on the dorsolateral prefrontal cortex (DLPFC) as a core region in drug resistance migraine for pain management. Transcranial direct current stimulations of the DLPFC (tDCS) could be affected as a recommended protocol but the effectiveness has been reported by similar studies, this study has tried to show that the effects could be increased when this protocol mixed with the heart rate variability biofeedback therapy (HRV_BFT). Although, it has suggested the combination of two protocols, the impacts of these interventions remain unexplored. he study investigated the effect of combined tDCS and BFB, on pain management in migraine responses.

Methods : In Glenview Clinic at the department of neural biofeedback in the northeastern area of Tehran capital city and following the clinical program for migraine patients. The patients affected with migraine who admitted to the clinic, and selected randomized over 3 years. The cases classified into the following three groups. The first group included the patients with tDCS intervention only and the second group included the patients with HRV_BFT intervention only, the last group included the patients who had taken both the tDCS and HRV_BFT together. The tDCS montage was done according to following the Left DLPFC (M1: motion first area of F3 in 10-20 standard system) as anodal area and Right DLPFC (FP2 in 10-20 standard system) as cathode area for the HRV_BFT, or a combination of tDCS + HRV_BFT groups. The score of Migraine pain measured by the MIDAS standard questionnaire, between 1 to 10 scores in ordinary

of the severity of the pain. The participants immediately compared the score of the MIDAS pain; the HRV_BFT biomarkers include heart rate and heart-rate variability. They followed by a duration of 10 sessions to three times a week for 4 weeks. ANOVA one-way was used for data analysis by SPSS-26.

Results : 198 patients by 38.4% male and 61.6% female participated in this study. The patients' age was in the range of 30 to 78 years and the mean ± SEM was 55±0.739. The third group with both tDCS and HRV_BFT interventions has shown significant deference (H=295, ? > 0.001 df=1). Any significant difference was observed between men and women (F=12.11, ? > 0.001, df=1). Tukey protocol was used for determining change between groups, so any difference between tDCS and HRV_BFT was observed (F=5.078, ? > 0.025, df=1).

Conclusion : Combining preventive tDCS with HRV_BFT is a relevant interventional approach to managing the pain in migraine, hence offering a new and non-invasive treatment of drug resistance migraine suggested according to the finding in this study.

Keywords : tDCS, Brain Stimulation, HRV, DLPFC, Drug Resistant Migraine.

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Count: 207
Abstract ID: 226
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Poster

Genetic basis of major depressive disorder: A comprehensive review on the influence of genetic factors corresponding to neurotransmitters on development of MDD

Submission Author: Mina Bordbar

Mina Bordbar[1]

1. Biotechnology department, Faculty of biological sciences, Alzahra University

Background and Aim : Depression is the most prevailing mental disorder in the world today. Numerous environmental factors such as chronic stress or post traumatic stress have been associated with major depressive disorder (MDD) in earlier studies. Most biological mechanisms leading to depression were found to be related to dopamine and serotonin pathways and their receptors. More recent studies have been attempting to shed a light on the underlying mechanisms causing this disorder. In most recent genome wide associated studies (GWAS) many genetic factors have been identified in association with MDD. Understanding the function and effect of these genes is crucial for the process of personal medicine and drug design for this disorder. According to studies, it is more likely that the disorder we know as major depressive disorder actually consists of a number of different disorders, each with their specific genetic pattern. Studying these patterns is crucial to advance our understanding of depression as well as enabling us to distinguish between different types of depression.
Methods : In this study we have reviewed the most recent studies on genetic factors that are associated with development of major depressive disorder and selected the most important genes identified in association with MDD, afterwards we categorized them according to their corresponding function using appropriate databases.
Results : This review has revealed that at least 10 genes have a potential role in occurrence of MDD, according to major studies performed to this day. The genes with the most evidence of correlation in different studies are associated with Dopamine, serotonin and other neurotransmitters and their receptors.
Conclusion : Polymorphisms in dopamine receptors is a defining characteristic in at least one type of MDD. Since depression is a disorder with complicated genetic pattern, large scale studies are required to reach conclusive results regarding the development of this disorder. Further studies with close observation of symptoms in relation to genetic mutations are required to define subtypes for MDD according to genetic factors.
Keywords : Major depressive disorder, genetics, depression, neurotransmitters

Count: 208
Abstract ID: 278
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Acute effects of quercetin-loaded liposome pretreatment on exploratory behavior in an animal model of schizophrenia induced by ketamine

Submission Author: Mohammad Aghazadeh Soltan Ahmadi

Mohammad Aghazadeh Soltan Ahmadi[1], Homeira Hatami Nemati[2], Hessan Aghazadeh Soltanahmadi[3], Parinaz Soleimanivand[4], Beheshteh Babazadeh[5]

1. B.Sc. Student of Molecular and Cellular Biology, Department of Plant and Molecular - Cellular Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Associate Professor of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. Department of Medicine, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
4. M.Sc. Student of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
5. Ph.D. Student, Department of Zoology and Physiology, Faculty of Biology, Baku State University, Baku, Azerbaijan

Background and Aim : Schizophrenia is an intense mental disease that affects around 1% of the global population. There are positive, negative, and cognitive symptoms associated with schizophrenia, which are attributed to a genetic combination and environmental factors. Numerous biological studies suggest that oxidative stress may contribute to schizophrenia pathophysiology. The central nervous system (CNS) cells are more susceptible to the damaging impacts of RS than cells in other organs. Oxidative stress appears to be associated with mitochondrial signaling and neuronal excitability, which negatively affect neuronal phenotypes and lead to schizophrenia and mood disorders. Quercetin (3, 3′, 4′, 5, 7-pentahydroxyflavone) is an antioxidant, anticancer, anti-inflammatory, and antiproliferative flavonoid found in many fruits and vegetables. Besides exerting neuroprotective properties, quercetin reduces oxidative stress in vivo. In addition, this substance can penetrate the blood-brain barrier (BBB). Quercetin formulated in lipid nanoparticles penetrates the brain more effectively. As part of this study, the acute effects of pretreatment with quercetin-loaded liposomes on exploratory behavior were assayed by the Hole-board test in a ketamine model of schizophrenia.

Methods : Fifty-six male Wistar rats (weighing 250 ± 50 g) were randomly divided into seven groups (n = 8 in each group): Control, Sham (Ethanol 9% v/v, intraperitoneal (i.p.) injection for 14 days), Quercetin (30 mg/kg; i.p. for 14 days), Schizophrenia (induced by ketamine, 20 mg/kg; i.p. for 14 days), Liposomal quercetin (30 mg/kg; i.p. for 7 days), Quercetin pretreatment +

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Schizophrenia induction, Liposomal quercetin pretreatment + Schizophrenia induction. Seven days after injection, we used the Hole-board test to assess the effects of quercetin and liposomal quercetin on exploratory behavior during schizophrenia induction.

Results : The results showed that there was no significant difference between the number of head dips in the control group and the schizophrenia group. Head-dipping significantly decreased in the schizophrenia group compared to the pretreatment with liposomal quercetin + schizophrenia group ($p<0.0001$). There was also a significant difference between the quercetin pretreatment + schizophrenia group and the liposomal quercetin pretreatment + schizophrenia group ($p<0.0001$). Data were analyzed by one-way ANOVA followed by Tukey test. $p<0.05$ was considered statistically significant.

Conclusion : Increasing evidence suggests that schizophrenia patients suffer from diminished antioxidant defenses, and recent clinical trials have demonstrated that enhancing these defenses may improve illness symptoms. As a bioflavonoid, quercetin is an effective free radical absorber and metal chelator that can prevent lipid peroxidation. As quercetin has powerful antioxidant properties and the underlying pathology of schizophrenia can be associated with higher oxidative stress, we compared the beneficial effects of quercetin in nanocarrier form (loaded into a liposome) to quercetin without a nanocarrier form to determine the potency of these antioxidant properties. Moreover, liposomal quercetin improved exploratory behavior after 7 days of treatment in schizophrenia model rats compared to quercetin treatment for 14 days. As a result, it stands to reason that introducing drugs in novel nanoforms can lead to more effective treatment approaches.

Keywords : Schizophrenia; Quercetin; Nanoparticle; Head-dipping; Exploratory behavior

Count: 209
Abstract ID: 395
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Comparison of family functioning of schizophrenic patients living in day and night rehabilitation centers in Sari city

Submission Author: Arash Hemati Manesh

Arash Hemati Manesh[1]

1. Ph.D student in Educational Psychology, Department of Psychology, Islamic Azad University, Roudhan Branch, Tehran-Iran.

Background and Aim : Studies and reviews show that the illness of one of the family members can affect the functioning of their family. The purpose of this research is to compare the family functioning of schizophrenia patients living in day and night rehabilitation centers in Sari city.

Methods : The current research is descriptive and comparative. The statistical population of the research included all the families of schizophrenia patients living in day and night rehabilitation centers in Sari city in 2018, and 100 people were selected as the research sample. In order to collect data, family function questionnaire (AFD), patient and caregiver demographic profile questionnaire were used. Descriptive and inferential statistics (independent t-test) were used to analyze the data.

Results : The results of the research showed that there is a significant difference in the overall functioning of the family between the two groups. Also, there is a significant difference between the two groups in the dimensions of family functioning (family relations, emotional companionship, emotional intercourse and behavior control). However, there was no significant difference in other dimensions of overall family functioning (problem solving and roles).

Conclusion : The findings of the research showed that the families of patients living in day care centers perform better than the families of schizophrenia patients living in day care centers.

Keywords : Schizophrenia patients, family functioning, rehabilitation centers

Count: 210
Abstract ID: 471
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Do we have changes in the level of cytokines in Schizophrenia?

Submission Author: Zeynab Zahedi

Zeynab Zahedi[1]

1. A) Faculty of medicine, Semnan University of Medical Sciences, Semnan, Iran; B) USERN Office, Semnan University of Medical Sciences, Semnan, Iran; C) Universal Scientific Education and Research Network, Tehran, Iran

Background and Aim : Schizophrenia is a complex disorder due to its diverse clinical phenotype, overlapping symptoms, and heterogeneous clinical manifestations. The development of autoantibodies against neurotransmitter receptors, altered immune cells, and increased complement cascade activity are recent indicators that immune dysfunction plays a role in the pathogenesis of schizophrenia. The goal of this study is to look into the level of cytokines in patients with schizophrenia.

Methods : The database PubMed, Cochrane, Web of Science, Embase, and Google Scholar were searched from inception to December 2022.

Results : After reviewing a total of 72 publications, 18 were ultimately chosen because they linked to the study's goal. The etiology of schizophrenia is heavily influenced by immune system malfunction, and current monoclonal antibody medications that target certain immune system components are now being used to treat schizophrenia. That altered blood levels and cellular production of cytokines are associated with immunological abnormalities in schizophrenia. Th1 and Th2 cytokine alterations in schizophrenia have been the subject of several research. Compared to healthy controls, schizophrenia patients produced much more IL-6 and TNF-α, whereas normal controls produced significantly less IL-2, IL-4, and IFN-γ.

Conclusion : Finding possibly "protective" alleles may be crucial for populations that are at risk. Individuals with first-episode schizophrenia and bipolar illness with psychotic characteristics have a pattern of high blood cytokine levels that partially overlaps. Furthermore, given the evidence for cytokine-mediated loss in total gray matter, findings imply that high proinflammatory cytokines may be especially implicated in the pathophysiology of schizophrenia.

Keywords : Cytokine; Immunotherapy; Psychosis; Schizophrenia

Count: 211
Abstract ID: 503
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

Education of self differentiation to reduce the rate of anxiety in Adolescents of the divorced families

Submission Author: Kazemian Somaye

Kazemian Somaye[1], saleh salehi[2]

1. associate professor
2. MA clinical psychology. Islamic Azad university, medical sciences, Qom

Background and Aim : This study aimed to find the effects of the education of self-differentiation on reducing the rate of anxiety in divorced children in Tehran, Iran.

Methods : It was an experimental study using pre- and post-test on two groups of experiment and control. At the first,we selected randomly one school among the schools in region 6 in Tehran and then we listed the names of divorced children and selected 16 person among 27 divorced children. 16 female students of divorced families in the age of 13-14 years were randomly divided into two groups of experiment and control. Cattle anxiety Inventory was used for data collection. The independent variable was ten sessions of the education of self-differentiation conducted for the experiment group and the dependent variable was students' scores of the questionnaire.

Results : Data were analyzed using the one-sided variance test. The results showed that with 95% certainty, the education of self-differentiation has been effective on reducing anxiety of the experiment group.

Conclusion : Data were analyzed using the one-sided variance test. The results showed that with 95% certainty, the education of self-differentiation has been effective on reducing anxiety of the experiment group.

Keywords : KEYWORDS: education of self differentiation, trait, state anxiety, adolescents of divorced families

Count: 212
Abstract ID: 72
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

The effects of postnatal erythropoietin and nano-erythropoietin on behavioral alterations by mediating K-Cl co-transporter 2 in the valproic acid-induced rat model of autism

Submission Author: Sara Haratizadeh

Sara Haratizadeh[1], Masoumeh Nozari [2], Mohsen Basiri [3], Mehdi Ranjbar[4], Fatemeh Darvishzadeh-Mahani[5]

1. Department of Anatomical Sciences, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
2. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
3. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
4. Pharmaceutics Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
5. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : In this study, based on the excitatory/ inhibitory imbalance theory of autism, the time window of GABA switch, the role of K-Cl co-transporter 2 (KCC2) in adjustment GABA switch, and brain permeability to erythropoietin (EPO), the effects of postnatal -EPO and-nano- erythropoietin (NEPO) have been evaluated in the valproic acid (VPA) rat model of autism.

Methods : The VPA was administered for animal modeling of autism at gestational day (GD) 12.5 (600mg/kg). Male offsprings were injected with EPO and NEPO in a clinically proper postnatal dosing regimen on postnatal days (PND) 1-5, and autistic-like behaviors were tested at the end of the first month. Then animals were sacrificed, and neuron morphology and KCC2 expression were examined by Nissl staining and Western blot.

Results : According to our findings, high-dose NEPO improved autism-associated phenotypes. Neuroprotective effects of EPO and NEPO have been shown in the hippocampus. Postnatal NEPO treatment reversed KCC2 expression abnormalities induced by prenatal VPA.

Conclusion : Our results might support the role of KCC2 in ASD and the excitatory/ inhibitory imbalance hypothesis. We suggested Nano- erythropoietin and other KCC2 interventions as a new approach to the early treatment and prevention of autism.

Keywords : Valproic Acid, Erythropoietin, Nano-Erythropoietin, Autism, K-Cl co-transporter 2

Count: 213
Abstract ID: 73
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

Astrocyte responses to postnatal erythropoietin and nano-erythropoietin treatments in a valproic acid-induced animal model of autism

Submission Author: Sara Haratizadeh

Sara Haratizadeh[1], Masoumeh Nozari[2], Mohsen Basiri[3], Mehdi Ranjbar[4]

1. Department of Anatomical Sciences, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
2. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
3. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
4. Pharmaceutics Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Despite ample evidence of the potential protective effects of erythropoietin (EPO) on the developing brain, no study has addressed the effects of postnatal EPO on behaviors and brain tissue of animal models of autism. In the present study, we examined the therapeutic effects of postnatal erythropoietin on stereotypic behaviors and astrocyte responses via glial fibrillary acidic protein (GFAP) and S100 calcium-binding protein B (S100B) immunohistochemistry in a valproic acid (VPA) animal model of autism. Also, we compared the effects of EPO with EPO-loaded solid lipid nanoparticles (NEPO) because the blood-brain barrier has limited permeability to EPO.

Methods : Pregnant rats received a single dose of VPA (600 mg/kg) at gestational day 12.5. EPO (2000U/kg) and EPO-loaded solid lipid nanoparticles (NEPO1000 and 2000U/kg) were injected intraperitoneally from postnatal days 1–5. Repetitive behaviors in male offspring were assessed by a marble burying test. The immune-staining method was performed to evaluate S100B and GFAP-positive cells in the prefrontal cortex and hippocampal CA1 region.

Results : VPA animal models revealed more repetitive behavior and displayed higher astrogliosis in the prefrontal cortex (PFC) and hippocampus (CA1) regions. The repetitive behaviors were ameliorated relatively in VPA groups with NEPO2000 treatment, and astrogliosis was reduced even when VPA rats were treated with a lower dosage of NEPO.

Conclusion : Our results indicate beneficial effects of postnatal NEPO exposure in the VPA animal model of autism, which proposes it as an early treatment in infants with, or at risk of, autism.

Keywords : Valproic Acid, Erythropoietin, Nano-Erythropoietin, Astrocytes, GFAP, S100B

Count: 214
Abstract ID: 95
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

The effects of Psilocybe cubensis on DNA methylation of some depression related genes in maternal separation stress model in mice

Submission Author: Eghbal Jasemi

Eghbal Jasemi[1], S Mahmoud A. Najafi[2], Ali Razmi[3]

1. School of Biology, College of Science, University of Tehran, Tehran, Iran
2. School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Medicinal Plants Research Center, Institute of Medicinal Plants, ACECR, Karaj, Iran

Background and Aim : Early life stress is known to promote long-term neurobiological changes, which may underlie the increased risk of psychopathology. Maternal separation (MS) is used as an early life stressor that causes profound neurochemical and behavioral changes in the pups that persist into adulthood. However, the exact mechanism of how MS alters these behavioral changes is not yet understood. 5-HT1A receptor, glucocorticoids receptor and serotonin transporter located in the hippocampus together with their epigenetic modifications, such as DNA methylation, are critical regulators of persistent gene expression changes may be related to depressive behaviors. The aim of the present study was to figure out whether Psilocybe cubensis, a 5-HT1A agonist, could alter behavioral effects and DNA methylation of the mentioned genes related to MS in adult mice.

Methods : Psilocybe cubensis extract of this mushroom was prepared by ethyl acetate. NMRI mice involved in all experiments and were treated with the vehicle, extract, or standard drug intraperitoneally. Open field Test (OFT) and forced swimming Test (FST) were applied to measure the intended parameters. OFT was performed to verify the applied doses for measuring the following antidepressant activity. Gene methylation was performed by Methylation Specific PCR (MSP).

Results : The results showed that MS enhanced immobility time in FST. Moreover, MS reduced time spent in center and velocity in OFT. Psilocybe cubensis extract reversed these behavioral parameters. MS led to hypermethylation of NR3C1 and SLC6A4 in the hippocampus of adult mice, while in response to single administration of Psilocybe cubensis extract during adulthood these genes clarified hypomethylation.

Conclusion : These results suggest that NR3C1 and SLC6A4 in the hippocampus may play a role in the effects of MS on FST and OFT in adult rats. MS increased DNA methylation in the promoter region of NR3C1 and SLC6A4 in the hippocampus. Since psilocybin binds to the serotonin receptors, MS may leave epigenetic marks these genes in the hippocampus, which could mediated by serotonin receptors specially 5-HT1A. The MS-induced alternations of DNA methylation in the promoter region of NR3C1 and SLC6A4 may be associated with vulnerability to the development depressive behavior in adulthood.

Keywords : maternal separation, DNA methylation, Psilocybe cubensis, mice

Count: 215
Abstract ID: 413
subject: Neuropsychiatry and Psychology: Disorders of Executive Functions
Presentation Type: Poster

The role of explore–exploit decisions in psychiatric disorders

Submission Author: Negar Karimi

Negar Karimi[1], Mojtaba Chizari[2], Reza Khosrowabadi[3]

1. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
3. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : Foraging is a fundamental behavior, and many animal species appear to use common mechanisms to solve their foraging problems. Perhaps the most common problem in foraging is choosing between using familiar options with known rewards or exploring unfamiliar options with unfamiliar rewards. This is the so-called exploration/exploitation trade-off. This trade-off has been extensively studied in behavioral ecology and computational neuroscience, but is relatively new in the field of psychiatry. The exploratory/exploitative paradigm may offer psychiatric research a new approach to examining motivational, outcome appraisal, and effort-related processes that are disrupted in many mental and emotional disorders. Moreover, the exploration-exploitation trade-off incorporates elements of risk-taking and impulsivity, providing a new framework for understanding these behaviors in an ecological context. Here, we describe relevant concepts and some common paradigms used to measure exploitation/exploitation decisions.

Methods : There are three behavioral paradigms that have been widely used in research on explore/exploit decisions. The most common is the n-armed bandit task, based on the n-armed bandit learning problem. A variant of the bandit task is the 2-armed 'leap frog' task. Here, there are two options, one option always has higher rewards than the other, and the value of each option is revealed after its selection. A third task that has been used frequently is the clock task. Here, in each trial, players must choose when to stop the hand to obtain a reward of unknown value, which is revealed after the choice has been made. These tasks and others used to measure explore/exploit decisions all share several common features, including multiple options to choose from, an a priori unknown reward structure, the opportunity to select options other than that with highest immediate value, and the need for experiential learning to make predictions about current and future reward values.

Results : Exploration/exploitation models have shown the ability to distinguish people with and without psychosis. In particular, several studies suggest that addictive disorders are associated with decreased exploratory decisions and increased exploitative decisions. This would indicate a preference for short-term behavioral planning and a preference for familiar and expected rewards over unfamiliar and/or unknown rewards. More importantly, more studies are needed to compare the sensitivity of exploratory/mining models to detect intergroup differences, compared with the traditional behavioral measures used in psychoanalysis. In particular, explore/exploit and other foraging patterns need to be tested against existing behavioral tasks to determine the best predictor of group differences, severity of symptoms, neuroregulatory disorders and treatment outcomes.

Conclusion : Further research is needed to compare the sensitivity of the exploration/exploitation model to detect differences between groups with traditional behavioral measures used in psychiatric research. In particular, exploration/exploitation and other foraging patterns need to be tested against existing behavioral tasks to determine group differences, symptom severity, neuroregulatory deficits, and the best predictors of treatment outcome.

Keywords : explore-exploit, decision making, psychiatric disorders

Count: 216
Abstract ID: 98
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Investigation of the effectiveness of cognitive method on the improvement of pragmatics in children with autism spectrum disorder based on electroencephalography evidence

Submission Author: Masoud Moghaddamnia

Masoud Moghaddamnia[1], Maryam Khalilkhaneh[2]

1. Assistant Professor, Shahed University of medical Science
2. Department of Linguistics, Ferdowsi University of Mashhad

Background and Aim : Human growth depends on his social interactions. Also, language plays an important role as an important part of human existence and human communication takes place through verbal and non-verbal language. Conversational skills are the most important skills of pragmatics. The disorders in which significant functional language defects are evident include children with autism spectrum disorder (ASD) who face successive communication failures due to defects in cognitive and conversational skills. Hence, providing therapies that focus on improving the conversational skills of these children is very important. The objective of this study is to improve the performance of pragmatics skills based on electroencephalography (EEG) evidence in 10 Persian-speaking children with ASD in the age range of 4-10 years. The objective of this study was to investigate the effectiveness of cognitive method (CM) on improving the speech of children with ASD. The theoretical approach is based on this hypothesis that the physiological, cognitive and emotional systems are connected to each other as two-way and continuous. Knowledge of this approach and its effectiveness on improving language and social skills can be a guide for therapeutic protocols to improve the development of theory of mind in children with various language disorders.

Methods : This study is descriptive-analytical. The subjects were ten 4-10-yesr-old children with autism during a 3-yesr period trained by a cognitive approach. At the beginning of the patient's referral to the center and after the training course, the subject's EEG was examined. The tool used in this study was the Children's Communication Checklist-2 U.S. edition (CCC-2) to measure the pragmatics skills. All these children were also examined by a child psychiatrist, a child neurologist, and a pediatrician, and based on the criteria of ASD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), the fifth edition.

Results : After the training course, the difference in the child's brain connections was compared with the pre-test. Beta waves have improved, which are responsible for concentration and learning and are slow in a child with ASD. Slow and fast waves in the prefrontal lobe had a better speed. The EEG data also showed that brain wave patterns and abnormal communication improved in the right posterior part of the brain, which is responsible for understanding non-verbal communication, facial expressions and emotions of others. In the meantime, the average scores of the pragmatics subscales in CCC-2 also improved gradually during the therapy in the subjects.

Conclusion : In general, it can be said that the CM intervention have led to developmental changes that result in increased abilities due to the passage of time and have had a special effect on the study results.

Keywords : Cognitive Method, Pragmatics

Count: 217
Abstract ID: 253
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

The role of emotion processing abnormalities in the emergence of Psychosis: A systematic review of the emotional processes impaired in schizophrenia.

Submission Author: Zahra Hosseinzadeh Maleki

Zahra Hosseinzadeh Maleki[1]

1. Assistant Professor, Department of psychology, Faculty of education sciences and psychology, Ferdowsi University of Mashhad. Mashhad, Iran.

Background and Aim : Individuals with schizophrenia significantly show impaired social cognition, which manifests as difficulties in identifying emotions, feeling connected to others, inferring others' thoughts, and reacting emotionally to others. Extrinsic and intrinsic processes for monitoring, evaluating, and modifying emotional reactions, their intensive and temporal features, to accomplish one's goals are Emotion regulation (ER). The process model in which the various strategies are allocated in terms of their direct impact on the emotion-generative process guided by distinct strategies, including reappraisal, suppression, and distraction.

Methods : This systematic review aimed to identify studies assessing the social processes impaired in schizophrenia. To identify articles with original data published after 2015 until 2021. A total of 125 publications were identified, of which 7 met the inclusion criteria.

Results : : Emotional abnormalities and Aberrant emotion processing are well-established components of schizophrenia. Also, there is consistent evidence for aversion to positive and neutral stimuli in schizophrenia which could be valence or task difficulty-dependent. Several functional magnetic resonance (fMRI) studies illustrated lower activation of emotional stimuli than neutral stimuli in schizophrenia patients. These findings mainly were reported for the bilateral amygdala about aversive stimuli and facial emotion expressions (e.g., explicit processing). Under-recruitment of other regions to emotion-related stimuli was also reported, such as the hippocampus, early visual processing regions, and frontal cortices. Amygdala hyperresponsivity has been demonstrated in the neurodevelopmental approach, in which a functional loss of parvalbumin interneurons in the hippocampus is associated with increased dopaminergic activity in the striatum. This systematic review of studies used emotion-processing task paradigms in individuals with schizophrenia. Image-based studies compared to controls showed decreased neural responses to emotion, particularly in the amygdala and anterior cingulate cortex. Mostly, there were no

significant differences between participants and controls, but a high degree of heterogeneity was identified across the studies.

Conclusion : However, the putative role of emotion processing in schizophrenia emergence and the underlying neurobiology remains unclear, particularly with results showing that deficits are predictive of functional outcomes and antipsychotic medication does not adequately treat emotion-related deficiencies in schizophrenia. Either of the three response patterns could be present in different individuals and collectively show amygdala hypoactivation. Future studies assessing activation to the neutral condition in healthy controls are needed.

Keywords : Emotional processes impaired, Cognitive emotion regulation, Cognitive psychology,

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Qualitative investigation of changes in self-perception in changing the affective relation with spouse

Submission Author: Saleh Salehi

Saleh Salehi[1]

1. MA clinical psychology. Islamic Azad university, Medical Sciences, Qom

Background and Aim : Aim: Affective relationship between the spouses and factors that influence on its changes has always been the focus of attention of couples therapists and experts of domestic problems.The quality of affective relationships between the wives is of the main indicators of the health of the family institution that in all aspects of family including sustainability, maintenance and children protection plays a fundamental role. Affective relationship influenced by many factors and conditions is subject to change and a very important factor in this context is changes in self perception. So the aim of this study was qualitative investigation of changes in self-perception of married women in changing the affective relationship with spouse.

Methods : Method: For this purpose, a qualitative approach and field theory method was used. The study population of married women included marital duration more than 5 years, 17 subjects as a research sample has been semi-structured interviews

Results : Results: After analyzing data from interviews, the selective codes of scopes of changes in self-perception (the scope of cognition of self and feelings about themselves), the areas of appearance of self-perception changes (in the domains of personal, relationship with spouse and social), and underlie factors of self-perception changes (of the intrapersonal and external factors) were identified.

Conclusion : Conclusion: The findings indicate that changes in self-perception have an important role in the formation and to change in personality and behavior will be effective in emotional relationship with spouse as well as underlie factors and the areas of appearance of self-perception changes is subject to change the affective relationship with spouse. This necessity of attention of couples therapists and experts of domestic problems indicates that with appropriate cognitive skills training to spouses provide the way for change in perception of couples in the fields of resulting in improved affective relationships with each other.

Keywords : Keywords: changes in self-perception, affective relationships of spouses, grounded theory

Count: 219
Abstract ID: 302
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Using Prefrontal and Midline Right and Left Frontal EEG-Derived Theta Cordance to Predict the Response to Transcranial Direct Current Stimulation in Patients with Treatment-Resistance Depression

Submission Author: Seyed Ruhollah Hosseini

Seyed Ruhollah Hosseini[1], Abbas Firoozabadi[2], Nikzad Ghanbari[3], Roghieh Nooripour[4], Fardin Farmani[5]

1. Department of Psychology, Faculty of Education Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran.
2. Department of Psychology, Faculty of Education Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran.
3. Department of Clinical Psychology, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.
4. Department of Clinical Psychology, Faculty of Medicine, Islamic Azad University Medical Branch of Tehran, Tehran, Iran.
5. Department of Psychology, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Today, due to the existence of different treatment approaches, there is an increasing need to choose the best method and predict the response to treatment in people with major depressive disorder (MDD). There is evidence that changes in electroencephalography (EEG) indexes can precede improvement in symptoms. One of these indexes is theta (4-8 Hz) cordance, which can be a biomarker of treatment effectiveness. This index indicates regional brain activity based on a combination of absolute and relative resting EEG power. There is evidence that early reduction of prefrontal (PF) and midline right frontal (MRF) theta cordance predicts response to various antidepressants.

Methods : This study aimed to investigate early changes (baseline to week 1) in PF, MRF and midline left frontal (MLF) theta cordance in 30 MDD patients treated with transcranial direct current stimulation (tDCS). Early changes in PF, MRF, and MLF cordance and in Beck Depression Inventory (BDI) scores were assessed alone, and in combination, to predict early treatment response.

Results : The results showed that the changes in PF and MLF cordance at the end of the first week after the tDCS were significantly reduced compared to the baseline. Cordance change in MRF was

not statistically significant. The results of comparing the changes in BDI score, PF, MLF, and MRF cordances in predicting early response to tDCS, showed that the MRF cordance change is significantly different from the rest of the indexes. Therefore, this index alone cannot be an accurate predictor of early response to tDCS. Prediction treatment outcome (responder/ non-responder) based on combining early changes in theta cordance and DBI scores from baseline to week 1 (?BDI+?PF, ?BDI+?MRF, ?BDI+? MLF), all combined predictor models were statistically significant.

Conclusion : These results suggest that early response to tDCS may be optimally predicted by combining both EEG and symptom-based measures after one week of treatment.

Keywords : Electroencephalography, Major Depressive Disorder, Transcranial Direct Current Stimulation Theta Cordance

Effects of Anodal Stimulation of Left Dorsolateral Prefrontal Cortex in Treatment-Resistance Depression Evaluated with Low-Resolution Brain Electromagnetic Tomography

Submission Author: Seyed Ruhollah Hosseini

Seyed Ruhollah Hosseini[1], Abbas Firoozabadi[2], Nikzad Ghanbari[3], Roghieh Nooripour[4], Fardin Farmani[5]

1. Department of Psychology, Faculty of Education Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran.
2. Department of Psychology, Faculty of Education Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran.
3. Department of Clinical Psychology, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.
4. Department of Clinical Psychology, Faculty of Medicine, Islamic Azad University Medical Branch of Tehran, Tehran, Iran.
5. Department of Psychology, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Treatment-resistant depression has a significant impact on the quality of life of patients. This situation will have severe individual, social, and economic consequences.

Methods : The method of the current study was quasi-experimental with a pretest-posttest design. Thirty patients with a primary diagnosis of treatment-resistance depression were recruited from outpatient psychiatric clinics in Tehran province, Iran, and selected through the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I). All patients had been under treatment with citalopram 20 mg/day for at least 6 weeks before transcranial direct current stimulation (tDCS). tDCS was administered with the anodal and cathodal stimulation over F3 and F4 respectively. The patients were assessed with beck depression inventory-II (BDI-II) before starting tDCS sessions, and at the end of week 2 (after 14 sessions of tDCS). Moreover, the EEG was recorded for all patients at the baseline and the end of week 2 of tDCS treatment.

Results : The comparison between after and before treatment with tDCS in treatment-resistance depression revealed that patients in post-treatment have statistically significant lower power spectrum density in theta, upper alpha, low beta, and high beta frequencies (T=3.1, p=0.0098). Moreover, the decrease in theta, upper alpha, low beta, and high beta power spectrum density

(Corr. p < 0.05 for |r| > 0.21) in several brain areas (especially the left hemisphere) has a statistically significant negative correlation with changes in BDI-II scores.

Conclusion : Adding new treatments based on neuromodulation to traditional drug treatments can changes in pattern of brain functional activity and improve these patients.

Keywords : EEG, Low-Resolution Brain Electromagnetic Tomography, Power Spectrum Density, Transcranial Direct Current Stimulation, Treatment-resistant Depression

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023 — Tehran, Iran

Count: 221
Abstract ID: 243
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Effect of crocin versus escitalopram in treatment of depression and anxiety in rats

Submission Author: Mehran Joodaki

Mehran Joodaki[1], Maryam Radahmadi[2], Hojjatallah Alaei[3]

1. Isfahan university of medical sciences
2. Isfahan university of medical sciences
3. Isfahan university of medical sciences

Background and Aim : According to studies, escitalopram (selective serotonin reuptake inhibitor) and crocin (the active substance of the saffron plant) have antidepressant and anti-anxiety effects. In this study, the antidepressant and anti-anxiety effects of escitalopram and crocin have been compared in behavioral tests.

Methods : In this study, Sixty-three rats were randomly allocated into nine groups: control, sham, a group under 14 days of chronic stress and 14 days without chronic stress after induction of depression, a group under chronic stress for 28 days even after induction of depression and five groups with stress-induce depression, which in a stress-free recovery period received daily intraperitoneal injection of escitalopram alone (10 and 20 mg/kg doses), crocin alone, and escitalopram (10 and 20 mg/kg doses) with crocin for 14 days after induction of depression. Forced swim test and open field test were used for evaluating depression and anxiety-like behavior in rats.

Results : Immobility time in the forced swim test on the 28th day was reduced in all treatment groups including crocin, escitalopram (both doses) and co-administration of escitalopram (both doses) and crocin. Although in the group receiving escitalopram at a dose of 20 mg/kg with or without crocin, the decrease in immobility was more significant. The center time was the same in all groups. Although, the center time was most significant in the escitalopram group alone at a dose of 20 mg/kg. The total travel time was increased only in the escitalopram group at a dose of 20 mg/kg and was low in the other groups. The total travel time was also significant in the depression group receiving 20 mg/kg of escitalopram compared to the depression group (28 days of chronic stress).

Conclusion : : Crocin, escitalopram and co-administration of escitalopram and crocin in all doses reduced depressive-like behaviors in rats. However, escitalopram at a dose of 20 mg/kg with or

without crocin more effectively reduced depressive-like behavior. Also, escitalopram at a dose of 20 mg alone was significantly effective in reducing anxiety-like behaviors in rats, but crocin had less effect on anxiety. Therefore, it is necessary to treat anxiety with crocin along with other drugs such as escitalopram. Finally, the increase in locomotor activity was significant only in escitalopram at a dose of 20 mg/kg, and crocin alone did not increase locomotor activity.

Keywords : Depression, Stress, Locomotor Activity, Immobility, Crocin, Escitalopram.

Count: 222
Abstract ID: 91
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Seroprevalence and association of human cytomegalovirus with mood disorder: A- systematic review and meta-analysis review

Submission Author: Zahra Yousefian

Zahra Yousefian[1], Seyedeh Masoumeh Seyedhosseini Tamijani[2], Hamed Ghazvini[3], Rahele Rafaei[4], Tahoora Mousavi[5]

1. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
5. 2- Assistant Professor of Medical Sciences Technologies, Molecular and Cell Biology Research Center (MCBRC), Faculty of medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : One of the most common mental illnesses is mood disorders. The number of people with these disorders have increased dramatically; For example, According to the World Health Organization (WHO), more than 322 million people in the worldwide suffering from depression. several factors have been implicated in the ethiology of it, such as inflammation. Among inflammatory factors, viruses take center stage and studies on cytomegalovirus (CMV) is increasing. CMV is common and latent viral pathogen that belongs to the herpes virus family. Because of the persistence of CMV in body and nervous system, this virus can be activated when the immune system is weakened and continue to exert their destructive effects throughout life. The aim of this study was to investigate the seroprevalence and association of human cytomegalovirus with mood disorder

Methods : Eligible articles were extracted using online international databases Science direct, Medline (PubMed), Web of Science (ISI), Scopus, and Google scholar between 2000 and 2022. After quality assessment and specific inclusion and exclusion criteria, the eligible articles were entered for meta-analysis. Assessment of heterogeneity among the studies of primary studies was performed using Chi-squared test (Cochran's Q) and I2 index. The statistical analyses were done using the Comprehensive Meta-Analysis (CMA) V.2. software. In this present study, 8 articles were finally included in the meta-analysis according to the inclusion and exclusion criteria.

Results : Our finding showed that the seropositivity of CMV in mood disorders were 51.6%. Our finding showed that there was statistically differences observed between Major Depressive Disorder (MDD) and control groups for frequency of CMV. 1.32 (13.27- 10.45). The results of the publication bias using Egger test, confirmed no publication bias in each subgroups. (P=0.49). The results of this meta-analysis study demonstrated that CMV infection might relate to in mood disorders

Conclusion : Furthermore, we found that there was statistically differences between MDD and control groups for frequency of CMV.

Keywords : mood disorders, cytomegalovirus, seroprevalence, meta-analysis

Count: 223
Abstract ID: 345
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Relationship between NSAIDs(nonsteroidal anti_inflammatory drugs) and depression. does celecoxib have a better effect?

Submission Author: Pegah Khaksari

Sasan zandi esfahan[1], Pegah khaksari[2], Elham saheban[3], Zahra hamzenejadi[4]

1. Ph.D. of pharmacology, Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
2. Medical student , Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
3. Medical student , Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
4. Medical student , Clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran

Background and Aim : Depression is one of the most common psychiatric diseases. Over the last few years, inflammatory mechanisms of depression have been noticed. Inflammation and depression have a relationship to each other, therefore many articles focus on the potential of antidepressants affecting NSAIDs (nonsteroidal anti_inflammatory drugs).

Methods : We tried to elucidate this effect by performing this review article. We searched on PubMed and Google Scholar by using the keywords inflammation / NSAIDs / depression/ibuprofen/indomethacin / Aspirin / ASA / mefenamic acid/piroxicam. 119 studies were initially found. Of these, 33 articles were chosen by title/abstract screening and full-text screening.

Results : The common type of NSAIDs has been studied in this article. The analysis could be speculated that NSAID treatments improve depression symptoms. Among nonselective cox inhibitors, we mentioned these drugs: at first Aspirin. Many factors are involved in the effect of aspirin on depression such as age, stage of depression, the severity of depression, level of inflammatory factors, and dose of prescribed aspirin. Different results of the effect of aspirin have been reported in the articles, which need to be further investigated in different populations. Mefenamic acid can make good effects on depression and chronic stress. Mefenamic acid plays a role in inhibiting microglia activation. Piroxicam has been reported to be convertible to Central Nervous System (CNS) acting agents but It has serious depressant effects at high doses. Depression is considered one of the side effects of indomethacin, but the research done is mostly on animal samples and needs more investigation. Ibuprofen can be effective but most of the articles were

animal studies. particularly the selective cox_2 inhibitor celecoxib inhibitors can reduce depressive symptoms. some biases exist because of differences between doses and the brand of drugs.

Conclusion : These findings suggest that NSAIDs can improve depression symptoms and Celecoxib provides more stable antidepressant effects compared to nonselective cox inhibitors. The dose of drugs in future articles deserves exploration and directed towards examining which of the nonselective cox inhibitors have more efficacy.

Keywords : inflammation / NSAIDs / depression/ibuprofen/indomethacin / Aspirin / ASA / mefenamic acid/piroxicam

Count: 224
Abstract ID: 156
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Daily oral memantine attenuated the severity of borderline personality disorder symptoms; a double-blind placebo-controlled, randomized clinical trial

Submission Author: Fariba Karimzadeh

Fariba Karimzadeh[1], Homa Mohammadsadeghi[2]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Mental Health Research Center, Department of Psychiatry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Borderline personality disorder (BPD) has been considered a psychological illness. The effective pharmacological treatments for BPD have not been well established. This study aimed to assess the efficacy of a low dose of memantine (10 mg daily) in BPD severity and cognitive impairment.

Methods : BPD patients diagnosed by psychologists were included and divided into placebo (n = 19) and memantine groups (n = 20). Included participants were randomized, double-blind, and stabilized on the medication and psychotherapy for at least four weeks. The patients in the Memantine group received oral memantine (10 mg daily) for four weeks. The severity of BPD was assessed by a self-reported questionnaire named Borderline Evaluation of Severity Over Time (BEST). The Wisconsin test was carried out to assess executive function.

Results : The mean score of the BEST tests significantly decreased after four weeks administration of memantine. There was no significant difference in the mean total score of the BEST test before and after the placebo administration. There was no significant difference in the Wisconsin subscales including the number of wrong answers, perseverative errors and categories achieved after memantine or placebo administration. Adverse side effects did not occur in any of the participants.

Conclusion : Our findings suggested the potential therapeutic effects of memantine for BPD. Further, a low dose of meantime might be preferable to prevent adverse side effects occurrences.

Keywords : Borderline Personality Disorder, Memantine, N-Methyl-D-aspartate, Wisconsin

Count: 225
Abstract ID: 148
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

The comparison of repetitive Transcranial Magnetic stimulation , citalopram and cognitive behavior therapy (CBT) on residual depression symptoms of patients with recurrent major depressive disorder

Submission Author: Sanaz Khomami

Sanaz Khomami[1], Roshanak Khodabakhsh Pirkalani[2], Reza Rostami[3]

1. Alzahra University
2. Alzahra University
3. Tehran university

Background and Aim : Residual symptoms of major depression significantly increase the risk of recurrence of depression. Despite of the effectiveness of CBT treatment on residual depressive disorder, one third of patients experience relapse of symptoms. Because of both serotonergic and noradrenergic dysfunction involving in residual symptoms, multi modules can target of these circuits. Hence the main concern of the present study was to evaluate the effectiveness of three enhanced citalopram, transcranial magnetic stimulation, and cognitive-behavioral therapy in residual symptoms of recurrent major depressive symptoms.

Methods : In this study, which used a pre-test-post-test design, 45 patients were randomly selected. Before and after treatment, participants completed the Beck-II Depression Inventory and each underwent one of the above treatments. After completing the Beck questionnaire and having the inclusion criteria, patients were randomly assigned to three groups; citalopram augmentative group (the dose of the drug was increased from 20 mg to 40 mg), the cognitive-behavioral therapy group (14 sessions and during 7 weeks) and repetitive transcranial magnetic stimulation (rTMS) group (10 Hz with 2.5 s interval on F3 with Neurosoft device). The results were analyzed through rANOVA and t-Test.

Results : The results confirmed the effectiveness of rTMS treatment on residual symptoms ($p < 000.1$). However, the other two methods had a significant effect on the symptoms, but the effect size of rTMS group was superior.

Conclusion : Among the above treatments, rTMS has a greater effect on the residual symptoms and other treatments can be effective in combination with this method.

Keywords : Citalopram, cognitive behavior therapy, Transcranial Magnetic Stimulation, Residual Symptoms of Depression

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Count: 226
Abstract ID: 187
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Examination and pathology of anxiety disorder, emotions and clinical-social behavior at the beginning of the corona epidemic

Submission Author: Soroush Ramezani Rad

Soroush Ramezani Rad[1]

1. Iranian Psychotherapy Studies Association

Background and Aim : After the start of the covid-19 epidemic in Iran and the problems that arose for people in the family and society, the general generator for causing anxiety disorder in people increased. the question arises that due to the sudden reduction of existing activities In the social and economic context, why do we still see many people in public transportation in Tehran? Therefore, we will examine this behavior.

Methods : The target population of the study is men and women in the ratio of 50/50 in the age range of 20 to 50 years, which was done in the number of 100 people. The tool used for this study is short questions from people in person, which has a 10% chance of error due to dishonesty/interview pressure in people's answers.

Results : People who suffer from anxiety disorders instinctively look for environments that will distract them from the problems that caused this trauma in order to cure and get rid of it. Also, as expected, their safe environment should have features such as Unpredictability and generality. Women cooperated better in this question, which can be concluded that in critical situations, women use anger control techniques better, but anger can be more visible in ruminative men.

Conclusion : In the summary of the final review, it should be said that one of the best controls and treatments to reduce the clinical symptoms of anxiety can be mental liberation. Also, helping to be in a safe environment increases the healing effects. It was observed that in addition to trauma control and therapy, men should have adjunctive therapy to reduce anger.

Keywords : Neurology and psychology;Anxiety disorder;Tehran;PTSD;Covid-19;

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Association of the dietary phytochemical index with mental health in overweight and obese women: A cross-sectional study

Submission Author: Atieh Mirzababaei

Atieh Mirzababaei[1]

1. Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS)

Background and Aim : previous studies showed that some dietary indexes are the most important reasons to increase the incidence and spread of mental health disorders and circadian rhythm. We aimed to assess the association between the phytochemical index with circadian rhythm and mental health disorders in obese and overweight women

Methods : Participants were selected from different health centers by a multistage cluster random sampling method. Dietary intake was assessed by a semi-quantitative food frequency questionnaire (FFQ) with 147 items. Dietary phytochemical index (DPI) was estimated using the following formula: (daily energy derived from phytochemical-rich foods (kcal)/total daily energy intake (kcal)) * 100. Symptoms of mental health disorders were assessed using a validated depression, anxiety, stress scales (DASS) questionnaire with 21-items

Results : The mean age and BMI of our participants were 35.19 and 30.48, kg/m2 respectively. After controlling for potential confounders, women in the highest tertile of phytochemical index (PI) had a lower prevalence of depression (P = 0.023). There was no association between PI and anxiety (OR = 1.001, 95% CI 0.945-1.060) and stress (OR = 0.992, 95% CI 0.940-1.046).

Conclusion : We found that high adherence to PI can decrease depression Moreover, there was a relationship between adherence to PI and circadian rhythm. However, there was no association between a high level of PI and other mental problems

Keywords : Mental health ,Phytochemical index

Count: 228
Abstract ID: 415
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

1-1) Evaluation of synergistic effect of quercetin and inhibition of renin-angiotensin system in the treatment of post-traumatic stress

Submission Author: Kimia Siahkamari

Kimia Siahkamari[1], Farshad Moradpour[2], Mojgan Veisi[3], Neda Omidian[4]

1. Department of physiology, Kermanshah University of medical science, Kermanshah, Iran
2. Department of physiology, Kermanshah University of medical science, Kermanshah, Iran
3. Department of physiology, Kermanshah University of medical science, Kermanshah, Iran
4. Department of physiology, Kermanshah University of medical science, Kermanshah, Iran

Background and Aim : Post-traumatic stress (PTSD) is the prevalent and costly neuro-psychiatric disorder which is appear after exposure to an acute stressor. many study use an antioxidants for treat various disorders such as anxiety, pain, insomnia, headache and etc. Quercetin is one of the most important antioxidants which has variety pharmacological affect such as reducing blood-pressure and inflammation markers, anti-cancer effect and preventing of oxidation. But there is no scientific study to indicate its effect on PTSD. In this research, we want to study the effect of Quercetin on post-traumatic stress.

Methods : The most common rodent model of PTSD is Single prolonged stress(SPS), which is include three stressor: 2h restrain, 20 minute force swim and exposure to Ether until lose of conscious. In this study, we divided 30 Wistar rats (200-250gr) randomly into three groups. One group received Quercetin (50mg/kg), IP, for 14 days(7days before and 7days after SPS). Another group only exposure to SPS. Control group did not receive any intervention until the end of the experiment. Seven days after SPS, we did behavioral test(open field).

Results : the comparison between control group and PTSD group(SPS), shows significant difference in open field maze. Also Quercetin group (received 50mg/kg) and PTSD group illustrate significant difference in open field maze ($p < 0.05$).

Conclusion : Sum up, this study illustrates that administration of Quercetin (50mg/kg) can decrease anxiety-like behavior in rats, in open field maze.

Keywords : Post-traumatic stress, antioxidant, anxiety, Quercetin

Count: 229
Abstract ID: 464
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Protective effects of selenium against depression and anxiety like behaviors induced by lipopolysaccharide in rats

Submission Author: Soheil Baharloo

Soheil Baharloo[1], Moein Gharaei[2], Farimah Beheshti[3]

1. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
3. Neuroscience Research Center, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : The effects of selenium in a rat model of lipopolysaccharide (LPS) induced anxiety and depression like behaviors were challenged.

Methods : The effects of selenium in a rat model of lipopolysaccharide (LPS) induced anxiety and depression like behaviors were challenged.

Results : LPS increased the immobility while decreased active and climbing time in FS test. In EPT, LPS decreased the time spent in the open arms while, increased the time spent in the closed arms. In OFT, LPS decreased the time spent in central zone compared with control. The higher dose of selenium improved performances of the rats in behavioral tests. LPS injection also increased MDA while decreased thiol, SOD and CAT. Selenium protected from brain tissues oxidative damage. The number of total WBCs was significantly increased in LPS in comparison with the control group. All doses of selenium induced a significant reduction in total WBC count.

Conclusion : It was demonstrated that selenium improved behaviors of depression and anxiety in a rat model of LPS induced anxiety and depression like behaviors. Moreover, the effects of selenium were accompanied with improving of oxidative damage biomarkers in the brain tissues. Additionally selenium showed a reduction in WBCs count.

Keywords : Selenium; Depression; Anxiety; Lipopolysaccharide

Count: 230
Abstract ID: 296
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Poster

Comparing between cognitive impairment of patients with obsessive compulsive disorder with normal people - EEG study

Submission Author: Mohsen Sedaghatkish

Mohsen Sedaghatkish[1], Mohsen Sedaghatkish Khoshkebejari[2], Amir Elyasi[3]

1. -
2. Institute for Cognitive Science Studies
3. Guilan University of Medical Sciences

Background and Aim : Systematic analysis over the past three decades has confirmed that OCD is related to disfunction of the cortico–striato–thalamo–cortical , preponderantly within the orbitofrontal cortex (OFC), dorsolateral anterior cortex, and basal ganglion. Neuroimaging studies advocate that the participation of a fronto-subcortical circuit, as well as the OFC and basal ganglia, within the expression of OCD may be a core feature. The integrity of this circuit is meant to be expressly joined to the chief psychological feature functions, that the higher-level mental processes that modulate sensory, motor, cognitive, memory, and emotive capabilities. Most studies have centered on numerous quantitative electroencephalography (EEG) parameters in patients with OCD. The most consistent findings are topographical abnormalities discovered in frontal and orbitofrontal areas. Our aims in this study, firstly, it was to guage the presence of cognitive impairment in patients with OCD. secondly , we tend to compare the cortical EEG sources between patients with OCD and healthy controls. finaly, we tried to find the association between EEG and cognitive function.

Methods : The severity of symptoms was measured by Yale-Brown Obsessive Compulsive Scale. The amount of cognitive dysfunction was measured by Cantab . additionally Attention and concentration were measured by Stroop CW Test and D2 Test. The EEG examination was carried out on 19-channel digital EEG with 9 Ag/AgCl surface electrodes placed according to the international 10/20 system. The data sampling rate was 250 Hz, and the acquired signals were filtered with digital low- and high-pass filtering at 0.15 and 70 Hz, respectively.

Results : Cognitive impairment was measured by Cantab, Stroop CW Test, and D2 Test. majority of patients had great results in the Stroop CW Test. Also, most patients had good results in the D2 Test. OCD patients revealed a rise of delta sources in superior, middle, inferior, precentral, orbital, and rectal frontal gyrus, frontal lobe sub-gyral area, superior and middle temporal gyrus,

parahippocampal gyrus, extranuclear area, limbic cingulate gyrus anterior cingulate, and insula. The best t-value was located in medial frontal gyrus (Brodmann area nine). However, we saw a rise of theta sources in inferior, middle, and superior frontal gyrus in the left hemisphere. The analysis did show statistically significant correlation between results of some of test of Cantab and Yale-Brown Obsessive Compulsive Scale score; there was only a trend (P=0.08).

Conclusion : Cognitive impairment was found only when using Cantab . in the other hand , we used D2 Test and Stroop CW Test for examining attention and concentration. The patients got great score in Stroop CW Test and also D2 Test. We found a rise of delta and theta sources in frontal areas in OCD patients. This rise occured solely in OCD patients with cognitive impairment measured by Cantab. we found frontal EEG abnormalities in OCD patients whose performance was weak in some of test of Cantab. This inconsistency may be explained by focusing on the disparate cognitive domains. Some of them assesses information processing, attention, visual scanning, and eye–hand coordination. other of them focuses on working memory and executive functions.

Keywords : obsessive-compulsive disorder, eeg, frontal areas

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Risk-Taking Behavior among Suicide Attempters in Normal and Addict Students

Submission Author: Nasrin Abdoli

Nasrin Abdoli[1], Mehdi Khodamoradi[2], Vahid Farnia[3], Serge Brand[4], Somayeh Jahangiri [5]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
3. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. Center for Affective, Stress and Sleep Disorders, Psychiatric Clinics of the University of Basel, University of Basel, Basel, Switzerland
5. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : Suicidal behavior is a major mental health concern both for the individual and for the public health. Among others, suicidal behavior is associated with impulsivity, risk-taking, pain tolerance, and a state of overarousal. In the present study, we investigated if suicide attempters (SAs) reported higher scores for risk-taking when compared with healthy controls (HC) of the general population.

Methods : A total of 616 individuals (mean age: 27.07 years; 51.5% females) took part in the study; of those, 240 (39%) were individuals with a suicide attempt (SA) within a timelapse of one to three months, and 376 (61%) were healthy controls (HC). Participants completed a series of self-rating questionnaires covering sociodemographic information, risk-taking (Risk-Taking Questionnaire 18; RT-18), and suicidal behavior (Suicide Behaviors Questionnaire-Revised; SBQ-R).

Results : Compared with HCs, individuals with SA reported higher risk-taking and suicidal behavior scores. The risk-taking questionnaire yielded a four-factor solution: Thrill and sensation seeking; Cautious procedure; Cautious decision making; Impulsive behavior. Compared with HCs, SAs showed the highest scores for thrill and sensation seeking and impulsive behavior.

Conclusion : Compared with healthy controls, individuals reporting a recent suicide attempt also reported a higher propensity to thrill and sensation seeking and impulsive behavior as a proxy of risk-taking behavior. The present results corroborate the notion that, among others, suicide attempts appeared to be less related to premeditation, but rather to impulsive and thus spontaneous behavior.

Keywords : Risk-taking behavior; suicidal behavior; suicide attempts; Student; Addiction

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The effect of subcutaneous injection of Memantine on Dopamine receptors DR2 and DR4 protein expression in Striatum area of Morphine addicted male rats

Submission Author: Sahar Khalili samani

Sahar Khalili samani[1], Solmaz Khalifeh[2], Mandana Hasanzad[3]

1. Department of Genetics, Faculty of Advanced Scinece and Technology, Tehran Medical sciences, Islamic Azad University, Tehran, Iran
2. Cognitive and Neuroscience Research Center, Amir al Momenin Hospital, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
3. Medical Genomics Research Center, Tehran Medical Sciences Islamic Azad University, Tehran, Iran

Background and Aim : Repeated use of drugs causes changes in nerve cells. These changes gradually affect the regulation of gene expression and become the basis of many behavioral abnormalities. The mesolimbic pathway, which is the dopamine reward pathway of the brain and has D2 and D4 dopamine receptors, is one of the primary pathways through which addictive substances can exert their effects on the brain. The current treatments for addiction have limited effectiveness and use. For this reason, the development of more targeted, new treatments and a better understanding of the brain mechanisms involved in addiction are needed to progress treatment. Therefore, this research investigates the effect of subcutaneous injection of memantine on the protein expression of dopamine receptors DRD2 and DRD4 in the striatum of male rats addicted to morphine.

Methods : Male Wistar rats were exposed to the administration of Morphine for 21 days. The dosage is 0.1 mg/ml on the first and second days, 0.2 mg/ml on the second and third days, 0.3 mg/ml on the third and fourth days, and 0.4 mg/ml from the seventh to the twenty-first day. On day 21, thirty minutes after the last Morphine exposure, (Memantine 5 mg/kg subcutaneously) was administrated. Striatum tissue was collected, and the Western blotting technique evaluated DRD2 and DRD4 protein levels.

Results : The result showed that chronic use of Morphine causes increased protein levels of DRD2 and DRD4 compared with the control group. Memantine administration increased the DRD2 and DRD4 protein levels compared with the control group. In addition, DRD2 and DRD4 protein levels in the treatment group increased compared with the memantine group. DRD4 protein levels increased in the treatment group compared with the memantine group.

Conclusion : In conclusion, our findings show that chronic Morphine consumption effectively affects dopamine receptor protein expression in transferring and reward systems. Furthermore, Memantine alters dopamine receptors' protein levels.

Keywords : DRD2; DRD4; Memantine; Striatum; Morphine; Protein level.

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Tehran, Iran

Count: 233
Abstract ID: 7
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Effect of Afghan Chehelghoza (Pinus gerardiana L.) extract on the number of jumping in morphine-dependent rats

Submission Author: Sayed Yousof Mousavi

Sayed Yousof Mousavi[1], Kawsar Alami[2]

1. Neuroscience research center, Kavosh Non-profit Educational-Research Institute, Kabul, Afghanistan
2. Neuroscience research center, Kavosh Non-profit Educational-Research Institute, Kabul, Afghanistan

Background and Aim : Opioid dependency is considered a serious health problem all over the world. As synthetic drugs have multiple adverse side effects, researchers are encouraged to use natural compounds for treating opioid dependency or withdrawal. Herbal medicines are known as potent drugs, with low cost and adverse effects. Chehelghoza is a pine nut, with economical, nutritional, and pharmacological values. There are pieces of evidence that it has significant effects on brain processes. This study is aimed to evaluate the effect of Afghan Chehelghoza extract on the number of jumping in morphine-dependent rats.

Methods : In this study, rats were randomly divided into six groups (Normal group, Morphine as a negative control group, Clonidine as a positive control group, and 3 extract-treated groups). Morphine dependency was induced by repeated subcutaneous administration of morphine hydrochloride at increasing doses (2.5, 2.5, 5, 10, 20, 40 mg/kg doses twice daily on 1st to 6th days respectively, and a single dose of 50 mg/kg on 7th day). The extract and clonidine groups received extract (250, 500, and 750 mg/kg, orally) or clonidine (0.2 mg/kg, i.p.) simultaneously with morphine. Four hours after the administration of the last dose of morphine, naloxone (3 mg/kg, i.p.) was injected and withdrawal signs were noted for 30 minutes. In addition, the proximate composition of Chehelghoza extract was determined by the HPLC method.

Results : Results showed that Afghan Chehelghoza extract (750 mg/kg) and also clonidine could significantly decrease the number of jumping in morphine-dependent rats ($P<0.01$). In addition, HPLC analysis showed that Chehelghoza is mainly constituted of lipid, protein, carbohydrate, and fiber.

Conclusion : Overall, a high dose of Chehelghoza extract can alleviate the number of jumping as a withdrawal sign in morphine-dependent rats. Its effect is comparable with the clonidine standard drug. As the main constituents of Chehelghoza are lipids, its effect on the number of jumping may be due to the presence of fatty acids and their effect on specific brain areas.

Keywords : Afghanistan; Pinus gerardiana; jumping; morphine dependency; Composition

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Count: 234
Abstract ID: 360
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

The triangle of drug addiction, immune dysregulation, and neurotrophic factors: is there a missing link?

Submission Author: Kiarash Saleki

Kiarash Saleki[1], Parsa Alijanizadeh[2], Mohammad Banazadeh[3], Nima Rezaei[4]

1. Student Research Committee, Babol University of Medical Sciences, Babol, Iran.; USERN office, Babol University of Medical Sciences, Babol, Iran.
2. Student Research Committee, Babol University of Medical Sciences, Babol, Iran.; USERN office, Babol University of Medical Sciences, Babol, Iran.
3. Kerman University of Medical Sciences, Kerman, Iran.
4. Corresponding author: Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran. Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran.

Background and Aim : The first references to neurotrophic factors are from to the 1950s when the nerve growth factor (NGF) was first uncovered. Newer research showed a substantial amount of information on neurotrophic elements. Yet, numerous questions regarding neurotrophin signaling still need to be answered. One of the principal topics in neurotrophin studies is their role in the immune system regulation. A key research question is the possible role of neurotrophin pathways in the neuropathological mechanisms associated with addictive behavior, such as alcoholism and cocaine addiction.

Methods : PubMed, Scopus, and Google Scholar were searched from conception until 2022 for studies. Keywords were 'Addiction', 'Neurotrophic factors' and 'immunity'. The results were narratively synthesized and analyzed qualitatively.

Results : The underdeveloped state of the adolescent central nervous system (CNS) makes it more prone to the influence of alcohol and drug abuse, whose consumption could lead to long-lasting neurobehavioral problems. A linkage among long-term alcohol use and imbalance in neurotrophin pathways was established in an experiment comprising males with alcohol addiction as well as control subjects. It was suggested that alcoholism could lead to dysregulation of pro-brain-derived neurotrophic factor (BDNF)–p75NTR–sortilin and mature BDNF (mBDNF)–TrkB interactions. Amounts of pro-BDNF, p75NTR, sortilin, mBDNF, TrkB, as well as their complexes, were

evaluated in the peripheral blood of the study participants. Levels of pro-BDNF and p75NTR proteins was enhanced, while levels of TrkB was attenuated in patients with alcohol addiction compared to healthy controls. TrkB and p75NTR is a receptor for BDNF. Other than alcohol, opioid receptors are related to immune system and neurotrophic factors. Worthy of note is that, T-cells exhibit all three types of opioid receptors on their exterior. Human research has demonstrated that short-term morphine treatment activates T-lymphocyte cytokine production, like IL-2 and IL-6, through augmenting development of B-cells. Moreover, T-cells can stimulate the production of BDNF through IL-4 on nerve cells. T-cells can produce varying effects based on their polarization: Th1 cells, that secrete proinflammatory cytokines (Il-1b, TNF-alpha, IL.17) increase pain hypersensitivity. On the other hand, Th2-cells dampen mechanical allodynia and thermal hyperalgesia in neuropathic simulations. Further, opioid addiction brings about a shift in the Th1/Th2 cytokine balance of peripheral CD4+ cells towards the Th2 feedback, and opioid addicts demonstrate dampened mitogenic responsivity of lymphocytes compared to healthy individuals. There is a role for BDNF in synaptic neuroplasticity, in particular as it relates to plasticity of AMPA receptor transmission after cocaine exposure. Lately, clinical evidence suggests that the serum BDNF level could serve as a biological marker in cocaine addicts to predict upcoming relapse, providing an alternative direction for exploring BDNF's possible relevance to the treatment cocaine addiction.

Conclusion : There is interesting evidence for the existence of a novel triangle comprising neurotrophic factors, immune imbalance, and drug addiction. However, data focuses mostly on alcoholism. The new data suggest the therapeutic potential of anti-inflammatory targets to avoid the long-term consequences of drug abuse in adolescence. The missing molecular link within this triangle needs to be investigated to enable future advancements.

Keywords : Neuroimmunology; Neuroimmunopsychology; Addiction; Neurotrophic factors

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Count: 236
Abstract ID: 276
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Psychologic effect of Covid-19 and psychiatric adverse effects of corticosteroids, Is there any relation between neuropsychiatric effects of Covid-19 and use of corticosteroids? : A narrative review

Submission Author: Shadnoush Aliaskari

Shadnoush Aliaskari[1], Sasan Zandi Esfahan[2], Mohammad Sabet Eghlidi[3]

1. Medical student, clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
2. PhD of pharmacology, clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran
3. Medical student, clinical Research Development Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran

Background and Aim : Corona virus disease or covid-19 is a type of acute respiratory syndrome which caused by a virus of corona family. This disease spread worldwide in a short time and has already affected huge number of people (more than 85 million people) and caused greater than 1.8 million deaths around the world since the first case confirmed in Wuhan china. Although the relation between anxiety, stress and Covid-19 is undeniable but the direct effect of SARS-COV-2 (severe acute respiratory syndrome coronavirus 2) on the central nervous system is still unknown. Coronavirus is also known to have potential neurotrophic effects and has serious psychiatric outcomes. During the pandemic corticosteroids used as first-line therapy regarding to their effects on hyperinflammatory immune response. However, corticosteroids associated with various psychological adverse effects from mild changes in mood to psychotic symptoms.

Methods : By searching the keywords corticosteroids, Adrenal Cortex Hormones, psychological, psychiatry, adverse effects, complications, and covid-19 in Google Scholar and PubMed databases. Our search strategy identified articles containing at least 1 medical subject headings (MeSH terms) from each of 3 categories: 1-Articles that, in addition to the psychological side effects of corticosteroids, the time period of use to cause side effects and the duration of the psychological side effects that can cause 2-Articles that refer to the psychological effects of covid-19 from 2019 3-Articles that may have made a connection between the effects of covid and corticosteroids.

Results : Psychiatric adverse effect of corticosteroids, 34 articles were found which include corticosteroid induced psychiatric adverse effects. different psychiatric conditions, such as insomnia, depression, delirium, and psychosis, happened during steroid therapy . Also, there were

a relation between corticosteroids effect and psychiatric parameters in pursuant to treatment indications. Psychological effect of Covid-19, 10 articles were appraised that mentioned the psychiatric sequelae of Covid-19. In these studies, reported a range of neurological symptoms such as altered consciousness, seizures, encephalitis and also neuropsychiatric outcomes both in acute stage and long term. Such as insomnia, anxiety, confusion and depressed mood in the acute stage. Probable connection between neuropsychiatric effects of Covid-19 and use of corticosteroids, We found 2 articles that covered the direct relation between the short course high-dose corticosteroids treatment during covid-19 can cause delirium, changing in mood, mania and hypermania.

Conclusion : we conclude that because of the huge use of corticosteroids for the treatment of covid-19 the neurological effects may due to the glucocorticoids. Physicians have to monitor patients carefully for psychiatric and cognitive side effects of corticosteroids usage against this disease. Further researches are needed to show the actual relation of neuropsychiatric effects of covid-19 and corticosteroids administration.

Keywords : Corticosteroids; psychiatric adverse effect; psycological effect; Covid-19

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The relationship between self-efficacy and suicidal thoughts in female students

Submission Author: Azam Rahimi

Azam Rahimi[1], Nasim Dastres[2], masume bigonah rudmajani[3]

1. Master's degree in Clinical Psychology, Marand Azad University
2. PhD student in Consulting at karaj Azad University
3. PhD Student in Health psychology at Torbat-e-Jam Azad University

Background and Aim : : Today, suicide is one of the major social and mental health problems in different strata of society, which unfortunately also exists in students due to the crisis of their identity, job and roles in society. Considering that self-efficacy plays a very important role in health-promoting behaviors and prevention of risky behaviors, the purpose of this study was to investigate the relationship between self-efficacy and prevention of suicidal thoughts in female students.

Methods : The research method is descriptive and comparative causal. The sampling method was available and was completed by students in virtual networks with the number of 100 people. 17-item Sharro Maddox Self-Efficacy Questionnaire and 19-item Beck Suicidal Thoughts Questionnaire were used. Descriptive statistical indices such as mean, percentage, frequency and standard deviation were used to summarize scattered information. And then Pearson correlation statistical methods were used to check the hypothesis. Data were analyzed using SPSS 24 software.

Results : There is an inverse and significant relationship between self-efficacy and suicidal thoughts ($p < 0.05$).

Conclusion : Self-efficacy is one of the elements that can play a positive role in maintaining health and preventing high-risk behaviors and suicide.

Keywords : self-efficacy, suicidal thoughts

Count: 238
Abstract ID: 313
subject: Neuropsychiatry and Psychology: Functional Neurological Symptom Disorder
Presentation Type: Poster

MicroRNAs as Promising Therapeutic Approach for Treating the Symptoms of Down Syndrome disease

Submission Author: Sepideh Ebrahimian vargahan

Sepideh Ebrahimian vargahan[1], Dr.Arshad hoseini[2], Maryam eini[3]

1. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Down syndrome is a genetic disorder in which the person has an extra number 21 chromosome. Those with this syndrome have different levels of physical and intellectual disabilities. This syndrome is the cause of one-third of intellectual disabilities which include mild or moderate IQ, delay in neuronal development and physical movements, speaking problems, risk of epileptic seizures, autism, Alzheimer's disease, and so on. Because this syndrome has a genetic basis it would be essential to understand its molecular mechanisms and biomarkers that may represent novel therapeutic approaches. Among the most recent studied molecular biomarkers are microRNAs which play crucial roles in different physiological or pathological conditions including Down syndrome. In this study, we will review more significant microRNA that could be a therapeutic target to improve disease symptoms in Down syndrome individuals.

Methods : Down syndrome is a genetic disorder in which the person has an extra number 21 chromosome. Those with this syndrome have different levels of physical and intellectual disabilities. This syndrome is the cause of one third of intellectual disabilities which include mild or moderate IQ, delay in neuronal development and physical movements, speaking problems, risk of epileptic seizures, autism, Alzheimer's disease and so on. Because this syndrome has a genetic basis it would be essential to understand its molecular mechanisms and biomarkers that may represent novel therapeutic approaches. Among the most recent studied molecular biomarkers are microRNAs which play crucial roles in different physiological or pathological condition including Down syndrome. In this study we will review more significant microRNA that could be a therapeutic target to improve disease symptoms in Down syndrome individuals.

Results : It is investigated that some important microRNAs including miR-99a, let-7c, miR-125b-2 and miR-155 are located on human chromosome 21. All of these miRs are overexpressed in the brain and hearts of Down syndrome individuals compared to the control group which is resulted from trisomy 21 gene dosage and are involved in disease symptoms. This overexpression may be associated to the neuropathology, leukemia, congenital heart defects and low rate of solid tumor development reported by affecting the target genes expression of related microRNA. Transcriptomic data had demonstrated a significant association in a subset of genes (Rufy2, Nova1, Nav1, Thoc1 and Sumo3) with miRNA dosage as well. It is also reported that injection of miR lentiviral sponges could be a therapeutic approach that decreases the expression of the microRNAs, make the expression of target genes more normal and improve the disease symptoms.

Conclusion : It seems MicroRNAs have an effective role in the development of Down syndrome symptoms and phenotype. Several studies on microRNA- target gene axes in Down syndrome patients could make the molecular basis of the disease more clear and have led to representing microRNAs as promising therapeutic targets.

Keywords : Down syndrome; microRNA; molecular basis; therapeutics

Count: 239
Abstract ID: 157
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Poster

Exercise improved the anti-epileptic effect of carbamazepine through GABA enhancement in epileptic rats

Submission Author: Fariba Karimzadeh

Fariba Karimzadeh[1], Mitra Barzroodi pour[2]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Carbamazepine (CBZ) is an anticonvulsant drug that usually is used for the treatment of seizures. The anti-epileptic and the anti-epileptogenic effect of exercise has been reported, as well. This study was aimed to evaluate the synergic effect of combined therapy of exercise and CBZ in epileptic rats, as well as the alternation of the GABA pathway as a possible involved mechanism.

Methods : The seizure was induced by pentylenetetrazol (PTZ) injection. Animals were divided into sham, seizure, exercise (EX), CBZ (25, 50 and 75), EX+CBZ (25,50 and 75). Treadmill forced running for 30 min has been considered as the exercise 5 days per week for four weeks. CBZ was injected in doses of 25,50 and 75mg/kg, half an hour before seizure induction and five hours after doing exercise in the animals forced to exercise.

Results : Seizure severity reduced and latency increased in the EX+CBZ (25) and EX+CBZ (50) groups compared to the seizure group. The distribution of GAD65 in both hippocampal CA1 and CA3 areas increased in the EX+CBZ (75) group. GABAA receptor α1 was up-regulated in the CA3 area of the EX+CBZ (75) group. The distribution of GAD65 in the cortical area increased in EX, EX+CBZ (50), CBZ (75) and EX+CBZ (75) groups. GABAA receptor α1 was up-regulated in the neocortex of EX+CBZ (50), CBZ (75) and EX+CBZ (75) groups.

Conclusion : Our findings suggested that exercise has improved the efficacy of CBZ and reduced the anti-epileptic dose. The enhancement of GABA signaling might be involved in the synergistic effect of exercise and CBZ.

Keywords : Seizure; epilepsy; carbamazepine; exercise; GABA

Count: 240
Abstract ID: 85
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Channels, Receptors, Transporters,
Presentation Type: Poster

Downregulation of the hippocampal ghrelin receptor type-1a during electrical kindling-induced epileptogenesis

Submission Author: Siamak Beheshti

Siamak Beheshti[1], Mansour Azimzadeh[2]

1. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran
2. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran

Background and Aim : Numerous studies have shown that the ghrelin hormone is involved in epileptic conditions. However, the profile of ghrelin or its functional receptor mRNAs in seizure-susceptible areas of the brain was not assessed during epileptogenesis. Here, we measured the expression levels of the hippocampal ghrelin or its receptor mRNAs in the course of electrical kindling-induced epileptogenesis.

Methods : The study was conducted on twenty adult male Wistar rats. One tri-polar and two uni-polar electrodes were implanted in the basolateral amygdala or skull surface using stereotaxic surgery. Animals were divided into four groups, consisting of two sham groups (sham1 and sham2), and two other groups, which were partially or fully kindled. After the establishment of partial or full kindling, the hippocampi of the animals and that of the corresponding sham groups were removed. A quantitative real-time PCR technique was used to measure the expression levels of ghrelin or its functional receptor mRNAs.

Results : The results indicated that the expression levels of ghrelin did not alter in either of the partially or fully kindled rats compared to the corresponding sham groups. Meanwhile, the mRNA expression levels of ghrelin receptors did not change in partially-kindled rats. However, the results showed that ghrelin receptors downregulated in the fully-kindled rats, significantly.

Conclusion : The outcomes of the current study highlight the crucial, but unknown impact of the hippocampal ghrelin receptors through the development of electrical kindling epileptogenesis, and points out the importance of GHSR-1a as a goal to adjust epileptogenic progression.

Keywords : Epileptogenesis; Ghrelin Receptor; Hippocampus; Electrical Kindling

Count: 241
Abstract ID: 75
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

The dentate gyrus endocannabinoid system mediates cross-state-dependent learning between morphine and nicotine in rats

Submission Author: Mohammadreza Rezaitabar

Mohammadreza Rezaitabar[1], Ameneh Rezayof[2], Ladan Delphi[3]

1. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
2. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran

Background and Aim : Cros-drug-induced state-dependent learning (SDL) may be involved in the increase of the risk of drug abusers abusing more than one drug to improve cognitive deficiency. Brain regions associated with memory formation through different neurotransmitter systems and signaling receptor pathways regulate reward-related learning, which is necessary for developing drug dependence and tolerance. The present study aimed to investigate the involvement of the dentate gyrus (DG) endocannabinoid system in cross-state-dependent learning between morphine and nicotine.

Methods : Adult male Wistar rats (200-230 g) were anaesthetized with an intraperitoneal injection of the ketamine-xylazine mixture and then bilaterally cannulated in the DG. They were allowed to recover for one week before the beginning of the experiments. The animals were trained and 24 hours later tested in a step-through type of passive avoidance task to measure memory retrieval.

Results : Our results showed that post-training subcutaneous (SC) administration of morphine (5 mg/kg) induced amnesia. Pre-test SC administration of nicotine (0.6 mg/kg) improved morphine response, suggesting a cross STD between the drugs. Acute post-training intra-DG microinjection of ACPA (4 ng/μl), a selective CB1 receptor agonist, potentiated the response of an ineffective dose of morphine to induce amnesia. The interactive amnesic effect of ACPA and morphine was improved by pre-test nicotine administration. Interestingly, chronic microinjection of ACPA (4 ng/μl), five times during 14 days after surgery, had the same effect as acute administration on morphine-nicotine-induced SDL. It should be considered that acute or chronic intra-DG microinjection of the same dose of ACPA had no impact on passive avoidance learning alone.

Conclusion : Taken together, it can be concluded that the DG activation of the endocannabinoid system potentiates the amnesia effect of morphine which could be improved by nicotine administration to induce cross SDL.

Keywords : Dentate gyrus; CB1 receptors; Morphine; Nicotine; Amnesia; Rat(s)

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Count: 242
Abstract ID: 217
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

IL4 Reduces Epileptogenesis Susceptibility Acutely After TBI: The Role of Macrophage/Microglia Polarization

Submission Author: Tara Asgari

Tara Asgari[1], Soheil Ghassemi[2], Hamid Gholami Pourbadie[3]

1. Pasteur Institute of Iran
2. Pasteur Institute of Iran
3. Pasteur Institute of Iran

Background and Aim : Rabies is a life-threatening viral infection of the brain. Rabies virus (RABV) merely infects excitable cells including neurons provoking drastic behaviors including negative emotional memories. RABV glycoprotein (RVG) plays a critical role in RABV pathogenesis. RVG interacts with various cytoplasmic PDZ (PSD-95/Dlg/ZO-1) containing proteins through its PDZ binding motif (PBM). PTZ domains have crucial role in formation and function of signal transduction. Hippocampus is one of the cerebral regions that contain high load of viral antigens.

Methods : We examined impact of RVG expression in the dorsal hippocampus on aversive as well as spatial learning and memory performance in rats. Two microliter of the lentiviral vector (~108 T.U./ml) encoding RVG or ΔRVG (deleted PBM) genomes was microinjected into the hippocampal CA1. After 1 week, rat's brain was cross-sectioned and RVG/ΔRVG-expressing neuronal cells were confirmed by fluorescent microscopy. Passive avoidance and spatial learning and memory were assessed in rats by Shuttle box and Morris water maze (MWM). In the shuttle box, both RVG and ΔRVG decreased the time spent in the dark compartment compared to control ($p < 0.05$)

Results : In MWM, RVG and ΔRVG did not affect the acquisition of spatial task. In the probe test, RVG-expressing rats spent more time in the target quadrant, and also reached the platform position sooner than control group ($p < 0.05$). Rats expressing ΔRVG significantly swam farther from the hidden platform than RVG group ($p < 0.05$).

Conclusion : Our data indicate RVG expression in the hippocampus strengthens aversive and spatial learning and memory performance. The boosting effect on spatial but not avoidance memory is mediated through PBM.

Keywords : Rabies virus glycoprotein ; Spatial memory ; PDZ binding motif

Count: 243
Abstract ID: 281
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

The role of cellular mechanisms of heterosynaptic plasticity in the work of neural networks

Submission Author: Ali Abonakour

Ali Abonakour[1], Alexey Malyshev[2], Olga Idzilova[3]

1. Moscow Institute of Physics and Technology, Moscow, Russia
2. 2 Institute of Higher Nervous Activity and Neurophysiology, Russian Academy of Sciences, Moscow, Russia
3. 2 Institute of Higher Nervous Activity and Neurophysiology, Russian Academy of Sciences, Moscow, Russia

Background and Aim : According to one of the central paradigms of modern neurobiology, synaptic plasticity is considered as the main cellular mechanism of learning and memory. This research aims to explore the role of the cellular mechanisms of the heterosynaptic type of plasticity in the functioning of the cortical networks in the whole brain in vivo. We employ the receptive field's neurons in the mouse visual cortex as an experimental model, using unpaired light-induced tetanization of a postsynaptic neuron with bursts of action potentials.

Methods : Primarily, work is being carried on hippocampal neuronal cultures cotransfected with two plasmid comstructs, blue-shifted channelrhodopsin of Platymonas subcordiformis, and a red fluorescent protein (RFP) mCherry. Blue-shifted opsin is capable of generating action potentials in the targeted postsynaptic neuron at a light frequency of 50-70 Hz, leading to cell tetanization, without using the invasive patch-clamp method, while the RFP allows us to study the spine mophology without stimulation of the opsin and thereby serving as experiment control. On the next stage, the work will be carried out on mice in vivo, wherein layer V pyramidal neurons will be transduced with an AAV virus carrying our optogenetic constructs. A section of the apical dendrite of a fluorescent neuron will be filmed using confocal microscopy, after which the neuron will be stimulated optogenetically with a train of laser pulses to perform tetanization, thereby causing a massive rearrangement of many synaptic inputs to this cell. Then, on 1-2 hour interval after tetanization, the same section of the dendrite will be photographed again. Since the effect of tetanization is to normalize synaptic inputs, there is reason to believe that we will be able to see this normalization in the morphological analysis of the shape and size of dendritic spines using the latest available quantitative analysis and classification tools.

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Results : Some preliminary results have been obtained, confirming the ability of our all-optical experimental design to stimulate the cell optogenetically and induce postsynaptic spikes with 50-70 Hz pulses, using blue-shifted channelrhodopsin, while avoiding the opsin activation when stimulating the RFP. We analyzed a part of the obtained results using a MATLAB algorithm that goes through the dendrite spine parameters data and checks each pair of spines before and after the experiment for relatively significant growth. By observing changes in spine's size, and taking into account the distances between neighboring spines, we try to describe the form of compensation or cooperation that heterosynaptic plasticity is taking for a further comparison with previous studies.

Conclusion : Recent research has been done on the correlation of the cellular mechanisms of synaptic plasticity with changes in the functional activity of the neuron, where Hebb's plasticity mechanisms were demonstrated to participate in the functioning of cortical networks in vivo. We hope in our study on a similar model, to explore the heterosynaptic changes in the inputs to our targeted neuron by up-to-date morphological analysis tools. Thus we hope to obtain fundamentally new experimental data on the cellular mechanisms of synaptic plasticity.

Keywords : Heterosynaptic plasticity; Optogenetics; Dendritic Spines; Visual Cortex

Count: 244
Abstract ID: 287
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Risk of osteoporosis in patients treated with antiepileptic drugs

Submission Author: Maryam Rahimi Tesiye

Maryam Rahimi Tesiye[1], Mona Zaersabet [2]

1. 1 Faculty of Life Science and Biotechnology, Shahid Beheshti University, Tehran, Iran
2. Department of Biology, Faculty of Sciences, University of Guilan, Rasht, Iran

Background and Aim : Epileptic patients treated with antiepileptic drugs (AEDs) have shown to be in the risk of osteoporosis development, a disease defined by progressive destruction of cortical and trabecular bone mass. This disease would gradually decrease the mineral density of bone marrow and lead to its fragility. It has been reported that patients with AEDs treatment, usually experience bone metabolism alteration and osteoporosis. In the current study, bioinformatics analysis was performed to evaluate gene expression profiling of patients with epilepsy to see if the genes involved in osteoporosis are deregulated.

Methods : 5 normal and 5 epileptic samples with GSE32534 were downloaded from the Ontology Gene Database (GO), then R package "limma" was applied to determine differentially expressed genes (DEGs). Using the Log2FC criterion and determining threshold $-4.362 \leq Log2FC \leq -2.000$ and P-value <0.05, 709 highly under-expressed genes were selected and entered into the String database for protein-protein network interaction (PPI) analysis. The network was then rebuilt in Cytoscape software and finally, 101 hub genes with a high score of degree, betweenness, and closeness centrality were selected. PPI network of these 99 hub genes was reconstructed in STRING database and entered into Gephi software, to determine the exact network of these genes and their type of communication.

Results : Data analysis showed that some of the hub genes with the highest scores were involved in physiological processes of bone formation and collagen production, and among the deregulated genes were COL3A1, COL5A1, COL6A1, COL6A3, and COL1A1. Also, studies have shown that any mutation in these genes is associated with a poor prognosis of osteoporosis and can decrease bone strength by reducing the level of bone mineralization. Consistent with our findings, evidence revealed that in the laboratory models of epilepsy, after treatment with AEDs, genes such as sclerostin, P1NP, and CBZ were also deregulated, and subsequently caused adverse effects on bone tissue.

Conclusion : Accordingly, it seems that in epileptic patients treated with AEDs, expression levels of genes related to bone formation and metabolism change significantly, which can subsequently give rise to osteoporosis. Therefore, targeting these genes can be one of the goals of future studies.

Keywords : Osteoporosis, Bioinformatics, Epilepsy

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Evaluating the effect of probiotics mixture on impaired spatial memory and inflammatory and oxidative stress markers and seizures on chemical kindling induced by pentylenetetrazole in rats

Submission Author: Samaneh Bagheri

Samaneh Bagheri[1]

1. نشاني: كيلومتر ٥ بلوار قطب راوندي- دانشگاه علوم پزشكي كاشان .دكتر محمود سلامى

Background and Aim : Epilepsy is associated with increased oxidative stress and disorders of the functioning of the nervous system, including memory impairment. Reports indicate that probiotics have antioxidant effects, as well as memory improving. This study was designed to investigate the effect of probiotics on severity of seizures, learning, memory and oxidative stress factors in male rats.

Methods : In this experimental study, 40 male Wistar rats were randomly divided into five groups: Control group; PTZ group; VPA group; Probiotic + PTZ and PTZ + Probiotic group. Probiotic complex including Lactobacillus rhamnosus, Bifidobacterium infantis and Lactobacillus reuteri bacteria, with a Colony Forming Unit (CFU) ~ 1010 for three weeks. Chemical kindling was performed with 12 times intraperitoneal injection (35 mg / kg) of PTZ every 48± 2 hours. Learning and spatial memory were evaluated by Morris Water Maze and oxidative stress factors (NO, MDA) and GABA measured.

Results : Probiotic mixture improved the learning process (P <0.0001) and spatial memory stability (P <0.05) in epilepsy rats. It also reduced the levels of NO (P <0.01), MDA (P <0.01) and increased GABA levels (P <0.01) in the PTZ + Probiotic group and decreased the level of NO (P <0.01), GABA (P <0.01), MDA (P <0.001) in the Probiotic + PTZ group.

Conclusion : Probiotic supplements decreased the severity of seizures in epilepsy mice by decreasing MDA, NO. GABA levels were significantly different in both probiotic treatment groups. Probiotic treatment improved spatial learning and spatial memory of epilepsy rats.

Keywords : Probiotics, Kindling, GABA, Learning and spatial memory, Oxidative stress

Count: 247
Abstract ID: 476
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Gestatinal stress potentiates epileptic behaviors in newborns rats

Submission Author: Ramin Ahmadzadeh

Ramin Ahmadzadeh [1], Shiva Roshan-Milani(MD, PhD)[2], Ehsan Saboory[3]

1. PhD candidate, Department of Reproductive Biology, Faculty of Modern Medical Sciences, Tabriz University of Medical Sciences
2. Professor, Department of physiology, School of Medicine, Urmia University of Medical Sciences
3. Professor Department of addiction studies, School of Medicine, Zanjan University of Medical Sciences

Background and Aim : Accordding to the previous studies, stress enhances seizure in epilepsy. But the underlying mechanisms and the extent of enhancement are not fully understood. Gestational stress probably leads to abnormal neuronal connectivity, causing cerebral functional disturbance. In the present study, effect of gestational Restraint stress on offsprin's epileptic behaviors has been investigated in rats.

Methods : Female rats (200 ±20 g) were studied in two groups of control and stressd. In the stressd group, at day 15 of pregnancy , rats were held immoble into the Plexiglas tube , twice per day , one hour per session for three consecutive days. Bicuculline (150 mg/kg, s.c) was injected to pups of both groups, at 25th day of age. Then, epileptic behaviors of pups were observed for 120 minutes.

Results : epileptic behaviors of stressed group showed significant changes in comparsion to control group: mean duration of onset of first epileptic behavior of control group was 5.35 ± 0.57 minutes which decreased to 3.21 ± 0.43 minutes in stressed group (p=0.01). In addition, mean frequency and duration of tonic-clonic attacks in control group was 5 times and 0.53 minute which increased to 8.2 times and 1.29 minutes in stressed group, respectively. Moreover, mortality rate during attacks showed an increase of 21.4 % in stressed group.

Conclusion : Congential stress can enhance neonatal epileptic behaviors in rats but to clarify the underlying mechanism further investigatinon should be performed.

Keywords : Epilepcy; gestational stress; restraint stress; bicuculline; seizuer

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Royal jelly attenuates epileptic seizures and oxidative stress in a rat model of temporal lobe epilepsy

Submission Author: Paria Hashemi

Paria Hashemi[1], Zakaria Vahabzadeh[2], Mohammad Raman Moloudi[3], Esmael Izadpanah[4]

1. Cellular and Molecular Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.
2. Liver and Digestive Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.
3. Neurosciences Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.
4. Cellular and Molecular Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.

Background and Aim : Epilepsy is the most prevalent chronic neurological disorder and has been considered as a condition of excessive neuronal discharge that results in spontaneous and recurrent unprovoked seizures. Among various types of epilepsy, temporal lobe epilepsy (TLE) is one of the most well-known forms of acquired and intractable epilepsy in adults, which is associated with the occurrence of spontaneous recurrent seizures and partial seizures originating from temporal lobe structures, especially the hippocampus. Numerous studies document that hippocampal sclerosis (HS) is a characteristic neuropathological finding in patients with TLE. It is caused by neurodegeneration or neuronal cell death in CA1, CA3 and hilar regions of the hippocampus. HS and oxidative stress are two important factors in the pathogenesis of TLE that involved in the initiation and development of seizures. Royal jelly (RJ) is a unique substance obtained from bees that has been recently demonstrated neuroprotective and antioxidant properties in several neurodegenerative models. Therefore, the aim of the present study was to investigate the pretreatment effect of RJ on epileptic seizures, hippocampal neuronal loss, and oxidative stress in the rat model of kainic acid (KA) induced TLE.

Methods : To this aim, 40 male Wistar rats weighing 200-250 g were divided into 4 groups, including control, RJ + sham-operated, KA, and RJ + KA. For induction of TLE, KA was administrated into the left lateral ventricle. RJ was pretreated (50 mg/kg/day) via intraperitoneal injection for two weeks. Oxidative stress markers including, malondialdehyde (MDA), total oxidant status (TOS) and total antioxidant capacity (TAC) as well as neuronal loss of in the CA1 region of the hippocampus (using Nissl staining) were evaluated in all groups.

Results : Our findings showed that RJ pretreatment significantly reduced seizure intensity and increased latency to the first seizure. RJ also reduced MDA and TOS while increasing TAC. In addition, RJ reversed neuronal damage in the hippocampal CA1 area.

Conclusion : In conclusion, our results suggest that RJ has anticonvulsant and neuroprotective effects in KA induced TLE via its antioxidative properties.

Keywords : Temporal Lobe Epilepsy; Royal Jelly; Kainic Acid; Oxidative Stress; Neuronal Damage; CA1 region

Count: 249
Abstract ID: 105
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Curcumin-loaded nanoparticles upregulate klotho and erythropoietin in experimental model of epilepsy

Submission Author: Sahar Rostami Mansoor

Sahar Rostami Mansoor[1], Tahmineh Gorgani-Firuzjaei[2], Maryam Ghasemi-Kasman[3]

1. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
2. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Curcumin is a low water soluble compound possesses several pharmaceutical properties including anti-inflammatory, anti-oxidative and anti-epileptic. In recent years, nanotechnology has been introduced curcumin-loaded nanoparticles (NPs) to increase its solubility. Several studies revealed that curcumin induces its protective effects on renal fibrosis by regulating the klotho molecule both in vitro and in vivo. Klotho, which is an anti-aging protein, is mainly synthesized in the kidneys; however, it is also expressed in the choroid plexus and hippocampus. Furthermore, overexpression of klotho enhances synaptic plasticity and cognition, and promotes hippocampal neurogenesis. Besides klotho, erythropoietin (EPO), a hematopoietic growth factor, also exhibits remarkable neuroprotective activity [12]. In addition to the kidneys, which are the main sources of EPO secretion, brain cells such as astrocytes and neurons are able to synthesize EPO as well. In this study, the effect of curcumin-loaded NPs on neuronal density was evaluated in PTZ-induced kindling model.

Methods : In order to induce the kindling model, PTZ was administrated intraperitoneally (i.p.) at dose of 36.5 mg/kg every other day for 20 days. Male NMRI mice received pre-treatment of free curcumin or curcumin-loaded NPs (12.5 mg/kg, i.p.) 10 days before PTZ injection and this was continued until 1 h before each PTZ injection. Immunostaining against NeuN, as a marker of neuronal maturation, and EPO was performed on hippocampal brain sections. Quantitative real time polymerase chain reaction (qRT-PCR) was conducted to assess the expression levels of tumor necrosis factor-α (TNF-α), klotho and EPO in the hippocampus

Results : Immunostaining data indicated that treatment with curcumin-loaded NPs significantly alleviates the neuronal cell death in PTZ receiving animals. Curcumin-loaded NPs effectively upregulated the levels of EPO and klotho in PTZ receiving animals. Furthermore, mRNA level of TNF-α was considerably reduced in animals undergone curcumin-loaded NPs treatment.

Conclusion : the results of this study suggest that downregulation of TNF-α and consequent upregulation of klotho and EPO might contribute to the neuroprotective effect of curcumin-loaded NPs in experimental model of epilepsy.

Keywords : Klotho; Erythropoietin; Curcumin-loaded nanoparticles; Pentylenetetrazol; Neuroprotection

Count: 250
Abstract ID: 127
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

The effect of exercise on the level of the of LDL, HDL, and iron in the epileptic rats inducted by pentylenetetrazol

Submission Author: Taha Ghantabpour

Taha Ghantabpour[1]

1. Department of anatomy, School of medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Epilepsy is a chronic noncommunicable disease of the brain that is characterized by seizures and affects about 50 million people worldwide. the correlation between epilepsy and physical exercise as a non-pharmacological approach has been noticed and many studies have shown physical activity as a complementary and non-pharmacological treatment has beneficial effects in the treatment of epilepsy. In this study, we investigated the effect of exercise on the serum levels of HDL, LDL, and iron in epileptic rats treated with pentylenetetrazol.

Methods : Thirty male Wistar rats were housed in the Central Animal Facility of Iran University of Medical Sciences. We divided the animals into five groups: 1) the Sham group, 2) the Control group, 3) the Seizure group, and 4) the Exercise with seizure groups (EWS). After familiarizing the rats with the treadmill, the exercise protocol was performed. After separate plasma samples, they were used for the determination of HDL, LDL) by using Randox assay kits (Sigma, USA)), and iron (by using iron and iron-binding capacity reagent (Sigma)).

Results : The present study showed that HDL decreased in CG compared to the sham group. Also, HDL was significantly higher in the SG group than in sham, CG, and SWE. LDL was increased in SWE compared to SG and sham groups but its value did not show significant enhancement compared to CG. Also, exercise can increase the reduction values of serum iron induced by seizure and exercise but they hadn't significant differences

Conclusion : According to our study, exercise can reduce the changes in levels of lipid profiles and iron that did following by seizure

Keywords : exercise ; lipid profile ; iron ; seizure ; epilepsy

Count: 251
Abstract ID: 100
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

The effect of copper and steel electrodes on the induction of electrical kindling: A comparative histological evaluation

Submission Author: Azadeh Yazdi

Azadeh Yazdi[1], Hakimeh Rezaie[2], Siamak Beheshti[3]

1. Department of Medicine, Najafabad Branch, Islamic Azad University, Najafabad, Iran.
2. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan
3. Department of Plant and Animal Biology, Faculty of Biological Science and Technology, University of Isfahan

Background and Aim : Epilepsy is a common disorder of the central nervous system. Various laboratory models exist to study the pathophysiology of this disease. The electrical kindling model of epilepsy is a putative model and equivalent to complex partial seizures with secondary generalization. A crucial requirement to produce kindled animals is appropriate wires, typically steel wires. However, these wires are expensive. Copper wires are argued to be neurotoxic, but are inexpensive. This study aimed to compare the electrical kindling parameters and the histological correlates using copper and steel wires.

Methods : Thirty-two adult male Wistar rats weighing 300 g were used in four groups. Animals were stereotaxically implanted with two copper monopolar electrodes on the skull surface and a steel or copper tri-polar electrode in the basolateral amygdala. Animals underwent a semi-rapid kindling protocol, using six stimulations with 20 min intervals. After showing stage five seizures, the animals were considered fully kindled. Then the animals were perfused, and their brains were fixed in paraformaldehyde, and after Nissl staining, they were examined histologically.

Results : The results indicated that all the animals were fully-kindled. However, rats with copper electrodes showed higher threshold intensities and delayed generalization of seizures, as indicated by the prolonged number of stimulations required to show seizure stage three. Histological evaluations showed that the amount of tissue damage was not significantly different in different groups. However, the number of dead cells was significantly lower in the group implanted with the steel electrode compared to the group implanted with the copper electrode.

Conclusion : Despite the fact that the copper electrode was capable of inducing kindled rats, the seizure parameters showed profound delays, which may be due to the probable neurotoxic effects of copper. Therefore, copper electrodes might not be used for laboratory evaluations, and the results of such studies can be misleading.

Keywords : Seizure, Electrical kindling, Steel and copper Electrode, Amygdala

Count: 252
Abstract ID: 405
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

Nigella sativa Oil Reduces LPS-Induced Microglial Inflammation: An Evaluation on M1/M2 Balance

Submission Author: Azar Hosseini

Azar Hosseini[1], Vafa Baradaran Rahimi[2], Vahid Reza Askari[3]

1. Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran
2. Department of Cardiovascular Diseases, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
3. Applied Biomedical Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : The immune system plays a critical defence role against infections, injuries, and carcinogenic stimuli. As the macrophages of the brain resides in the innate immune system, microglia and their polarisation (M1/M2) play regulatory roles in inflammation in CNS, such as Parkinson's, Alzheimer's, dementia complex, and multiple sclerosis. Nigella sativa belongs to the Ranunculaceae family and has different anti-inflammatory and antioxidant effects. We conducted this study to evaluate the anti-inflammatory and protective properties of N. sativa oil (NSO) on the microglial cells and their polarisation (M1/M2) in the presence of LPS as a model of neuroinflammation.

Methods : The protective effects of NSO (10–40 µg/ml) were studied on the LPS-induced microglial cells, and the levels of tumour necrosis factor-α (TNF-α), interleukin-1β (IL-1β), IL-6, prostaglandin E2 (PGE2), and IL-10 were evaluated using both ELISA and gene expression methods. The levels of cyclooxygenase-2 (COX-2), inducible NOS (iNOS), and arginase-1 (Arg1) were also evaluated using the real-time PCR method. In addition, nitrite oxide (NO) and urea were measured using biochemical methods.

Results : NSO decreased LPS-induced toxicity at all doses (< 0.001). NSO (10–40 µg/ml) also significantly reduced the levels of TNF-α, PGE2, IL-1β, and IL-6 in the presence of LPS (< 0.01 to 0.001). Pretreatment with NSO attenuated the levels of iNOS but increased Arg1 (< 0.001). The ratio of iNOS/Arg1 was also decreased in the presence of NSO (< 0.001) than that of the LPS group (< 0.001).

Conclusion : NSO attenuated LPS-induced inflammation and increased microglia's anti-inflammatory status. These results may prove that NSO is potentially an immunomodulator for various neurodegenerative diseases by M1 phenotype dominancy, such as Alzheimer's and Parkinson's diseases.

Keywords : Lipopolysaccharide, Nigella sativa, Microglial,

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Count: 253
Abstract ID: 175
subject: Novel and Cutting-Edge Technologies: Brain Mapping   (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Recent advances and future directions in imaging of peripheral nervous system: A comprehensive review for therapeutics monitoring

Submission Author: Arash Shabani

Arash Shabani[1], Auob Rustamzadeh[2]

1. Department of Radiological Sciences, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : The peripheral nervous system (PNS) consists of histological layers of endoneurium, epineurium, and perineurium. Each layer determined the attitude of nerves toward the diagnosis system. Nerve injury is the most common PNS disease which appears with a range of curable processes to nerve body degeneration. Axonal degeneration emerges after nerve injury due to Wallerian degeneration and inflammation as the inseparable factor of nerve damage. Magnetic resonance imaging occasionally needs to be taken into account to determine the type of injury, as well as, the interpretation of the nerve regeneration process. Moreover, by applying contrast agents it could be possible to reinforce the image contrast to better define the details along with tracking drug delivery and estimating the efficiency of the therapeutic methods.

Methods : Selecting proper imaging sequences to maximize the detection sensitivity is the purpose for which the study was conducted. To perform this research two article databases of PubMed and Elsevier were utilized with the proper keywords in the title and abstract.

Results : Recently, DWI imaging has been employed to have a clear concept of disease diagnosis, however, the DTI method could be successfully implemented to track the rate of nerve regeneration. Based on the effect size of the selected articles, it can be suggested that the DTI method reflects much better results in PNS imaging in comparison to the other sequences of MRI. Also, the ultrasound is successfully performed to detect nerve injury and quantitatively analyze microcirculation in injured peripheral nerves. This technique has multiple advantages like real-time imaging, nevertheless, it provides much less resolution in contrast to the MRI techniques. Gadofluorine M contrast media was reported to have the potential ability to detect several nerve damages, including demyelination and Wallerian degeneration. This fact that in the nerve injury

process the signal intensity concentrated in the damaged area, it can be concluded that the blood-nerve barrier is responsible for the high influx of Gadofluorine M reaching near the nerves. Eventually, it is noteworthy to briefly mention that the Diffusion basis spectrum imaging (DBSI) method could provide a larger amount of data compared to DTI, however, still the DTI data acquisition produces enough information to be aware of the condition of the peripheral nerve.

Conclusion : Nowadays researchers mostly put focus on CNS disease and morphology, nevertheless, PNS is part of the nervous system and plays a crucial role in several activities, as well as, receiving data from the environment. Peripheral nerve injuries have many subunits, which cause difficulty in proper diagnosis and prescribing proper therapeutic methods. Neuroimaging could be the proper candidate for disease diagnosis and follow-up therapeutic strategies. The results highlighted FA and RD as a proper indicators of the quality of myelin sheath, however, FA could better indicate the myelin sheath integrity. Among other parameters, MD lacks the minimum criteria to be considered as a diagnosis value, while AD could still be perceived as an additional data provider for the RD and FA.

Keywords : PNS; MRI; ultrasound; neuroimaging; nerve regeneration.

Count: 254
Abstract ID: 130
subject: Novel and Cutting-Edge Technologies: Brain Mapping   (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

The place of Neuroimaging and Brain Mapping in Neuroscience

Submission Author: Mohsen Zeini

Mohsen Zeini[1]

1. Neuroscience Department, School of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Neuroscience is an interdisciplinary science that studies the human nervous system with the help of various sciences and tools, and brain mapping is a set of neuroscience techniques such as neuroimaging that leads to the study of the brain and its function.

Methods : This is a review study in which the related articles were found in ISI web of science and PubMed databases. The following items were reviewed: brain mapping techniques such as molecular & optogenetics, engineering, neurophysiology, neuroanatomy and neuroimaging techniques such as MRI, CT scan, Quantitative Susceptibility Mapping (QSM), PET, SPECT, Digital Subtraction Angiography (DSA), Photo acoustic Imaging (PAI), Molecular Imaging of the Blood-Brain Barrier (BBB) and Trans-Cranial Doppler (TCD).

Results : It became clear in reviewing article that Brain mapping methods are progressing and these methods are based on image acquisition, analysis and display of these images which finally leads to presenting a part of the brain map. Each of the mentioned imaging methods is making significant progress, for example, in the MRI discussion, the functional MRI technique plays a significant role in neuroscience studies.

Conclusion : brain mapping and neuroimaging are the most important tools of neuroscience and in recent years, they have made significant progress and have made a significant contribution to advancing the goals of neuroscience. It seems that the developments in this field need more explanation.

Keywords : brain mapping; neuroimaging; CT scan; MRI; fMRI

Count: 255
Abstract ID: 326
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

A brief review of mechanisms and signaling pathways of deep brain stimulation

Submission Author: Hamideh Asadinezhad

Hamideh Asadinezhad[1], Ardeshir Nabizadeh[2]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Deep brain stimulation (DBS) is a minimally invasive surgical treatment method that involves implanting stimulating electrodes within certain areas of the brain. Stimulation of brain structures for the treatment of mental illnesses began in early 1947. However, DBS was first used in 1987 to improve tremors in Parkinson's patients. This method, which has been noticed again in recent years, is used to treat movement disorders, dementia, and mental illnesses such as depression, obsessive-compulsive disorder (OCD), schizophrenia, addiction disorders, and aggressive behavior.

Methods : Research materials were extracted from at least 35 articles using the following databases: Science Direct, Google Scholar, Medline, and PubMed using the keywords: deep brain stimulation, depression, and deep brain stimulation, deep brain stimulations history, deep brain stimulations mechanisms, prevalence, deep brain stimulations signaling pathway

Results : Despite the use of DBS in the treatment of diseases, the exact mechanism of its action is still unclear, however, several mechanisms have been proposed to explain it by researchers, including neuronal depolarization blockade, changes in the functional oscillation of the neuron, synaptic inhibition, synaptic excitation, changes in plasticity, neurochemical effects, as well as mechanisms of neurogenesis and neuroprotection, etc. DBS mechanisms can generally be divided into two categories, acute and chronic, in terms of the onset of the effect, which seems to be the neurotransmitter regulatory effects and electrophysiological effects, while plasticity and neurogenesis are chronic effects, and it is noteworthy that these mechanisms have a reciprocal effect on each other. According to observations, DBS is effective to treat patients with drug-resistant depression, by stimulation in the cingulum, (VC/VS) ventral capsule/ventral striatum, (STN) sub thalamic nucleus, (GPI) globus pallidus internus, (ITP) inferior thalamic peduncle, (NAC) nucleus accumbens, (ALIC) anterior limb of internal capsule, (LH) lateral habenula, and

especially the subgenual cingulate area (Cg25).On the other hand, numerous animal and human studies have been investigated in the field of DBS signaling pathways in the treatment of depression, such as glutamate pathway, mTOR pathway, BDNF, etc., which indicate the effect of this therapeutic method on depression.

Conclusion : depression is a common mental illness and one of the major debilitating disorders in the world. Therefore, the use of alternative methods of DBS can be considered as a suitable solution for the treatment of these people, so, more identification of the mechanisms and pathways of this method can lead to more knowledge and therefore more optimal use of this method, while reducing its side effects. thus, in this article, we briefly reviewed the proposed mechanisms for DBS as well as the signaling pathways of DBS in depression.

Keywords : deep brain stimulations; depression; signaling pathway; mechanism

Count: 256
Abstract ID: 320
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

Reconstructing the imagined sound: a step toward a universal inner mic

Submission Author: Shahrokh Mousavi

Shahrokh Mousavi[1], Hossein Parsaei[2]

1. Shiraz Neuroscience Research Center, Shiraz University of Medical Sciences, Shiraz, Iran; Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Shiraz Neuroscience Research Center, Shiraz University of Medical Sciences, Shiraz, Iran; Department of Medical Physics and Biomedical Engineering, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Brain-computer interfaces have created new means of communication. In this field, electroencephalography is the most common non-invasive modality used. Auditory imagery is among the least studied paradigms. Most study designs use words or syllables as the imagery object and aim at classifying the recorded electroencephalogram into the imagery objects. Some others use other sounds like musical rhythms and pitches. This experiment aims at testing the feasibility of a new general-purpose method for decoding the imagined sound through a problem of regression to predict the power spectral densities of the constituent frequencies of a specified sound, in contrast to its classical definition for classification.

Methods : Electroencephalography (an online database by Coretto et al. 2017) was performed on fifteen participants during imagination and pronunciation of five vowels (/a/, /i/, /o/, /e/, /u/) through six channels at a sample rate of 1024Hz and the vocal data at 44100Hz. Each trial's vocal data went through a one-dimensional discrete Fourier Transform, and the results corresponding to the frequencies between 19Hz and 1982Hz were picked with an interval of 9.82Hz (a total of 200 units as the expected output). The electroencephalogram of the imagery trials (3316 trials) was divided into training (2658 trials ~80%), validation (334 trials ~10%), and testing datasets (324 trials ~10%). A two-dimension convolutional neural network was developed and trained as follows: 64 two-dimensional filters in the first layer, 128 one-dimensional filters in the second layer, a flattening layer, a normalization layer, a dense layer with 128 neurons, and the output layer (dense layer with 200 neurons). The training was stopped after 100 epochs with no decrement in loss (mean squared error). The model with the least validation loss was saved. The Pearson's correlation coefficient and the coefficient of determination were calculated for every single unit separately across all outputs (a total of 200 coefficients for each metric). All steps of data preprocessing, model development, training, and testing were performed using Python programming language (V 3.8.0) and Tensorflow library (V 2.8.0).

Results : The best-trained model yields 200 values for each prediction. Pearson's correlation coefficient on the test dataset was averaged 0.028 ± 0.0548 with a maximum of 0.160. This value averaged 0.011 ± 0.011 on the training dataset. Furthermore, the coefficient of determination had 41 values above 0 on the test dataset (20.5% of the units) with a maximum of 0.0072. It had as well 160 values above 0 on the training dataset (80% of the units) with a maximum of 0.0017. Therefore, the model has been able to partially predict 20.5% of the output units. However, the very limited number of electroencephalogram electrodes (six) and non-optimal stimuli (vowels in contrast to pure pitches) are the main factors that curb the model's performance.

Conclusion : The developed model was able to predict the power spectral densities of the constituent frequencies of the imagined sounds, although partially. However, higher densities of electroencephalogram electrodes and more apt stimuli can significantly boost its performance.

Keywords : brain computer interfaces;sound imagery;electroencephalography;deep learning;regression analysis;convolutional neural networks

Count: 257
Abstract ID: 316
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

A spike temporal pattern approach to boost decoding accuracy and reduce computational complexity in BMI systems

Submission Author: Danial Katoozian

Danial Katoozian[1], Hossein Hosseini-Nejad[2], Mohammad-Reza Abolghasemi Dehaqani[3]

1. FPGA Laboratory, Faculty of Electrical Engineering, K. N. Toosi University of Technology, Tehran, Iran.
2. FPGA Laboratory, Faculty of Electrical Engineering, K. N. Toosi University of Technology, Tehran, Iran.
3. Cognitive Systems Laboratory, Control and Intelligent Processing Center of Excellence (CIPCE), School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran.

Background and Aim : By Processing neural information, Brain Machine Interface (BMI) systems can create a connection between the brain and an external machine. This information can be used in neuroscience research to study decision-making and changes-of-mind or can be processed to control a prosthetic limb by paralyzed individuals. As a result of the more preferable temporal and spatial resolution of the modern intracranial recording devices as an invasive approach, intra-cortical recording systems are desirable candidates to convert complex neural data into commands for BMIs. The decoding of neural signals is one of the most challenging sections in BMIs. The main purpose of decoding section is translating the neural information to a command which is understandable for the machine. With a deep study of the decoding methods applied by other researchers, it is determined that most of these methods are just employing firing rates as inputs for their algorithms; these methods are generally categorized as two approaches: non-recurrent and recurrent methods. In non-recurrent algorithms, an attempt is made to map the firing rate of just one moment to its related movement without considering its time variations. Although these methods are popular due to their reasonable computational complexity, they naturally are not considering the temporal neural information in their algorithms. In this reasons, other methods apply recurrent neural networks to improve the accuracy even more. For example, Long Short-Term Memory (LSTM) processes temporal information and estimates the output space based on the current firing rate and the past stored data.

Methods : Because in both categories, the input space is firing rate, the calculation is not optimum for a hardware implementation. This fact is more important when the input space is noticeable and multiply operator should be employed for each of the inputs, since the multiply is not a hardware friendly operator. In this reason, in our LSTM approach instead of firing rates, the actual binary spike patterns are used. Because the input patterns are just zero and one, the first step multiply

operators would be replaced by simple adders in hardware implementation which is preferable. In this paper, by merging some successive detected spikes, an approximation would be firstly applied. This pre-processing step reduces the input space volume and avoid data lost for further process, simultaneously. Not only for more accurate results, the data is still a series of firing rate, but also as a result of limitation to one and zero the input space is more suitable for hardware implementation.

Results : This method is evaluated based on a real dataset recorded from Frontal Eye Field (FEF) of two male rhesus monkeys with eight possible angles as the output space and presented a decoding accuracy of 61%.

Conclusion : By simulation results, it is illustrated by well-tuned related parameters, applying spike temporal patterns instead of firing rate as decoding inputs would conduct to a more or equal accurate result with significant reduction in computational complexity.

Keywords : Intro-cortical neural recording; Decoding of neural signals; deep learning; LSTM; spike temporal pattern.

Count: 258
Abstract ID: 372
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

A comprehensive comparison study of spatial filtering-based methods for frequency recognition of steady-state visual evoked potentials in brain-computer interface

Submission Author: Fatemeh Davarinia

Fatemeh Davarinia[1], Ali Maleki[2]

1. Biomedical Engineering Department, Semnan University, Semnan, Iran
2. Biomedical Engineering Department, Semnan University, Semnan, Iran

Background and Aim : The brain-computer interface (BCI) can directly communicate between humans and the real world. Steady-state visual evoked potential (SSVEP)-based BCI stands out among many BCI paradigms owing to their high performance in terms of information transfer rate (ITR), high signal-to-noise ratio (SNR), reliability, and design flexibility. However, interference from spontaneous EEG activities can deteriorate the detection performance. Since most of these methods try to enhance SNR, combining the electroencephalogram (EEG) signals from multiple electrodes so that the desired SSVEP components can be strengthened while the non-SSVEP components can be suppressed have been proposed. Such a linear combination of the multi-channel EEG signals is referred to as spatial filtering. Although various spatial filtering algorithms have been developed with different prior knowledge and characteristics of SSVEPs, determining the best method for each SSVEP-based BCI application has been challenging.

Methods : This study explored and compared the current state-of-the-art spatial filtering algorithms, including canonical correlation analysis (CCA), filter bank CCA (FBCCA), Multi-set CCA (MsetCCA), L1-regularized Multi-way CCA (L1-MCCA), individual template CCA (IT-CCA), combined IT-CCA and CCA, ensemble sum of squared correlations (eSSCOR), and ensemble task-related component analysis (eTRCA). Two benchmark datasets with 40 and 12 stimulation targets with initial phase and our nine-target paradigm dataset validated the performance of each method.

Results : Overall, with a longer time window, more channels, and more trials, the performance of all methods was improved. Since the 40 and 12-target databases considered the stimulations with the initial phase, the eTRCA method outperformed other algorithms. In contrast, due to not applying the stimulation phase in the nine-target database, the combined CCA & IT-CCA performed better. Furthermore, this database reaped the benefits of the coordination between eye

and hand during pointing movement to targets that may increase visual attention. Consequently, even the CCA provided the relevant results for the nine-target database as a calibration-free and straightforward method. Considering that all methods are implemented on multi-channel EEG data, feature extraction and classification of SSVEP data are performed with the help of a linear combination of spatial filtering coefficients. In general, spatial filtering includes the eigenvectors of the covariance matrix. For example, the covariance matrix in the eTRCA method is created by trial data, which depends on noise, time window, and the number of trials. Therefore, when the covariance matrix is unreliable, the calculated spatial filtering will not be accurate, and the results will not be suitable. As a result, more trials or longer time window that contains more data information will increase the reliability of covariance matrix estimation.

Conclusion : According to the SSVEP paradigm, the time window length, the number of targets, stimulation frequencies, or applying the initial phase, different algorithms can be recommended in practical BCI systems. For example, for a short time window and stimulation with an initial phase, the eTRCA method can provide suitable results, or CCA can be more applicable for stimulation frequencies without the initial phase.

Keywords : Steady-Stae Visual Evoked Potential; Brain-Computer Interface; Spatial Filter; Frequency Recognition;

11th Basic and Clinical Neuroscience Congress 2022
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Count: 259
Abstract ID: 63
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Screening of potential Mu opioid receptor ligands from herbal ingredients: in silico study

Submission Author: Mehdi Eivani

Mehdi Eivani[1], Javad Ebrahimian[2]

1. Brain and Cognitive Science lab, Center for Convergent Technologies, Tehran, Tehran, Iran
2. Alumni Association of Sharif University of Technology, 11365-11155, Tehran, Iran

Background and Aim : Opioid receptors include three types of G protein-coupled receptors, mu, delta, and kappa, are distributed throughout the peripheral and central nervous systems. They have an adequate distribution in areas that play a vital role in responding to anxiety including, the neocortex, hippocampus, amygdala, and hypothalamus. These receptors are involve in pain, anxiety, learning and memory and etc.

Methods : The best Mu opioid receptor pdb structure was found from PDB database (PDB ID: 5C1M, Resolution: 2.1 Å and organism: Mus musculus). Structure validation was performed by PROCHECK, Most favoured regions: 93.0%. We used YASARA Energy Minimization Server to energy minimization. The structure validation was performed again and this time most favoured regions was 94.1%. Then, we used this energy minimized structure for docking. The molecular structures of the Ligands were obtained from PubChem. Ligand binding site was found (using discovery studio Visualizer Client). Two residues (HIS54 and ASP147) were selected for flexible portion of the receptor. Docking was performed using AutoDock4, MGL Tools 1.5.6

Results : As shown in Table 1, the binding energy between mu receptor and Crocin, Silibinin, beta-Boswellic acid, Curcumin, Glabridin and Sesamin was -10.8, -8.65, -8.6, -8.2, -8.19 and -8.16 kcal/mol, respectively. This parameter was -7.73 kcal/mol between morphine and receptor. The inhibition constant (Ki) of Crocin and morphine in interaction with mu receptor were 0.01212 nM and 2.17 μM, respectively

Conclusion : Mu receptor had lower binding energy in interaction with Crocin, Silibinin, beta-Boswellic acid, Curcumin, Glabridin and Sesamin than morphine. And Crocin showed many lower Ki than morphine. It depicts that receptor- Crocin complex is more stable. So, it seems that the using of Crocin in studies to finding a substitute for morphine and decreasing its side effects will be useful

Keywords : Docking, Mu opioid receptor, Morphine, herbal ingredients, Crocin.

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Brain Delivery Systems Based on Artificial Intelligence and Biomimicry

Submission Author: Nasibeh Rady Raz

Nasibeh Rady Raz[1], Mohammad-R. Akbarzadeh-T.[2]

1. Department of Computer Engineering, Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Mashhad, Iran
2. Department of Computer & Electrical Engineering, Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Mashhad, Iran

Background and Aim : Blood-Brain Barrier (BBB), made up of endothelial cells, exists in the cerebral microvessels to control brain-body communications and prohibit harmful delivery to the brain. Carrier shape, elasticity, size, locomotion, and charge are essential features in BBB penetration. In this paper, we review several possible brain delivery using artificial intelligence and biomimicry which are at the theoretical stage.

Methods : The brain, as a coordinator of the body organs, needs more protection in targeted delivery. This issue creates opportunities and challenges for mimicking safe and possible brain delivery. Several theoretical brain delivery carriers are investigated, such as nanoparticles (NPs), polymeric NPs, lipid-based NPs, inorganic NPs, and biomimetic NPs. There are also several categories for various biomimetic NPs, including cell membrane biomimetic NPs, cell-loaded NPs, extracellular vesicles (EVs)- loaded NPs, and virus-like NPs. One of the main issues in brain delivery is NPs clearance from the reticuloendothelial system; therefore, immune cells such as macrophages, neutrophils (NEs), dendritic cells, and monocytes are proper delivery carrier candidates. Neural stem cells also improve the delivery process. In addition to biomimicry, artificial intelligence helps the brain delivery with the precise control, targeted delivery, prediction of BBB permeability, preparing safe and simple delivery by applying softcomputing and machine learning algorithms.

Results : Biomimicry along with artificial intelligence can help to model, infer, design, and control efficient brain delivery carriers.

Conclusion : Effective brain delivery is a gate to better brain disease improvement. However, there is a barrier as BBB to brain delivery. To overcome this delivery challenge, highly multidisciplinary research, e.g., artificial intelligence, material science, and medicine should be involved. This paper reviews several state-of-the-art brain delivery focusing on artificial intelligence and biomimicry.

Keywords : Artificial Intelligence; Blood-Brain Barrier; Biomimicry; Drug delivery;

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Count: 261
Abstract ID: 271
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic
Techniques & Gene . Therapy
Presentation Type: Poster

Evaluation of dimethyl fumarate on methotrexate-induced hepatotoxicity in mice: the role of Nrf2/HO-1 and apoptosis pathways

Submission Author: Mohamad ali Karimi

Mohamad ali Karimi[1], Dr. Mohammad Javad Khodayar[2], Dr. Maryam Salehcheh[3]

1. Department of Toxicology, School of Pharmacy, Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
2. Toxicology Researh Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
3. Toxicology Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background and Aim : Methotrexate (MTX) is a folate antagonist that is widely used as a chemotherapy and anti-inflammatory drug; However, administration of Methotrexate is associated with acute toxic adverse effects. Dimethyl fumarate (DMF) is an immunomodulatory drug recently approved by the FDA for the treatment of multiple sclerosis (MS). This research was aimed to determine whether DMF can activate Nrf2/HO-1 antioxidant pathway to deal with Methotrexate induced hepatotoxicity in mice or not.

Methods : In this research, 42 NMRI mice were divided into six groups: control, injury with MTX, positive control with DMF and three treatment groups with DMF in addition to MTX injury. MTX was injected intraperitoneally at a dose of 20 mg/kg to four groups on the fifth day; also, DMF was being administered orally (gavage) with doses of 30, 60 and 120 mg/kg to mice for ten days. Mice were sacrificed on the 11th day after the last DMF administration.

Results : Adverse effects of MTX on liver made an ascending in aminotransferases (AST, ALT), but there was no Significant change in the level of Alkaline phosphatase (ALP) between groups; DMF could decrease the level of serum mentioned enzymes. Unexpectedly, antioxidant and anti-apoptotic factors (SOD, CAT, GSH, Nrf-2 and HO-1) increased in the MTX group; So that SOD level was increased significantly compared to the control group (p-value<0.001). In the three treatment groups, increasing antioxidant and anti-apoptotic factors (SOD, CAT, GSH, Nrf-2, HO-1 and Bcl-2), and Caspase 3 pro-apoptotic downregulation could decrease the oxidative stress injury in a dose-dependent manner; so that the upregulation in Bcl-2 gene was significant compared to the MTX group. Unexpectedly, the amount of TBARS in the DMF120 groups had an unusual increase, and in the MTX group, only a slight increasing in the amount of TBARS occurred compared to the control group. The improvement of liver morphology confirmed the biochemical findings.

Conclusion : 1- DMF, as a potent Nrf2 activator, was able to improve the antioxidant defense system in the mice liver with its antioxidant and Antiferroptotic properties and reduce Methotrexate induced oxidative stress in a dose-dependent manner. 2- The unusual increase of TBARS in the DMF groups confirms that this drug is not very safe at the molecular and cellular level. Since DMF30 could bring the TBARS concentration below the control, it would be better to prescribe DMF in low concentrations during a chronic and long-term treatment period. 3- The increase of antioxidant and antiapoptotic variables in the injury group probably indicates the replacement of the ferroptosis pathway instead of the apoptotic cell death pathway.

Keywords : Hepatotoxicity, Methotrexate, Oxidative stress, Dimethyl fumarate, Antioxidants, Nrf2/HO-1, Nrf-2 activator, Mice

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Proliferation, viability and toxicity effects of Vismodegib on DAOY medulloblastoma cell line, an in vitro study

Submission Author: Masume Behruzi

Masume Behruzi[1], Fateme Moradi[2]

1. Department of Anatomical Sciences, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Anatomical Sciences, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Medulloblastoma as the most common brain tumor in children and a high level of invasion, requires rapid treatment. If the tumor is removed completely by surgery, there is no metastasis , and no tumor cells are visible in the CSF, the prognosis is usually good. Sonic Hedgehog (SHh) pathway mutations are known to be responsible for one third of medulloblastoma cases. As SMO plays an important role in regulation of SHh-pathway, targeting this protein has been a remarkable strategy in SHh-dependent cancers, specially medulloblastoma. GDC-0449 or Vismodegib is an SHh signaling pathway inhibitor and the first drug to be approved by the FDA for targeting SHh-derived cancers. Although the toxicity of this drug is generally mild, it is able to bind to SMO with high affinity and effectively inhibit SHH-Gli signaling.

Methods : Human DAOY medulloblastoma cells were prepared from Pasteur Institute (Tehran, Iran) and cultured in DMEM (Dulbecco's Modified Eagle's Medium) high glucose with FBS 10% and penicillin-streptomycin 1%. 50, 80, 100 and 150μM doses of vismodegib were used to treat cells. MTT, Scratch and trypan blue assay were performed 24 and 48 hrs post treatment.

Results : MTT assay showed that viability of DAOY cells in treatment groups was significantly different from the control group, after 24 and 48hrs. The difference between doses of 100 and 150?M at 24hrs, and the difference between doses of 100 and 150 with 50?M, and between 100?M and 150?M at 48hrs, was also significant. Results of scratch test showed that in the control group, the cells have managed to repair the lesion, while the scratch was disintegrated in higher doses. trypan blue staining revealed that the difference in cell death between control and 50?M was not significant. The difference between doses of 80,100 and 150?M with 50?M and between 100 and 150?M with 80?M was significant.

Conclusion : Vismodegib is able to inhibit proliferation of DAOY cells, in vitro. Due to the low toxicity and high affinity, it could be used in the field of medulloblastoma.

Keywords : Cell line, Drug Therapy, Medulloblastoma, Neoplasm

Count: 263
Abstract ID: 174
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

Virtual Reality Systems for Breast Cancer Survivors Rehabilitation

Submission Author: Parisa Arzani

Parisa Arzani[1], Fatemeh Rahimi[2]

1. Assistant Professor, Department of Physiotherapy, School of Rehabilitation sciences, Semnan University of Medical Sciences, Semnan, Iran.
2. Assistant Professor, Shahrekord University of Medical Sciences, Shahrekord, Iran.

Background and Aim : The number of new cancer cases has increased steadily over the last 30 years. Over the past two decades, virtual reality (VR) has been the subject of growing interest in oncology. VR is a subject of interest and curiosity in cancer research. A growing number of researchers are studying the impact of VR to improve the patient's quality of life.

Methods : We proceeded stepwise using five databases: Google Scholar, PubMed, Cochrane, CINAHL, and Sciencedirect to search for relevant studies. We narrowed the search from 2011 to 2021. In each database, we used the search terms: virtual reality and breast cancer, virtual reality and oncology, virtual reality and pain, virtual reality and cancer and pain.

Results : A total of eight studies met the inclusion criteria and were included in this study (Chirico et al., 2019; Bani Mohammad and Ahmad, 2018; Pizzoli et al., 2019; Schneider et al., 2011; Espinoza et al., 2012; Gupta and Hande, 2019; Garrett et al., 2020; Buche et al., 2021). During long hospital stays, VR is used as a distraction tool to promote emotional and physical well-being (37.5 % / 3/8 studies) (Bani Mohammad and Ahmad, 2018; Espinoza et al., 2012; Gupta and Hande, 2019). Its application in oncology is no longer limited to chemotherapy sessions (25%, 2/8 studies) (Chirico et al., 2019; Schneider et al., 2011). Distraction under VR is now used in palliative care (9.09%, 2/22 studies) to relieve symptoms in terminally ill patients at home (12.5%, 1/8 studies) to manage patients' chronic pain (Garrett et al., 2020). In physiotherapy, this distraction strategy has recently been proposed during post-mastectomy scar massage sessions by comparing participative and contemplative distraction (12.5%, 1/8 studies) (Buche et al., 2021). Finally, only one study went outside the medical context to test the first virtual laboratory experiment measuring the effects of VR associated with two different relaxation techniques (i.e., breath control vs. Body Scanning Procedure) on breast cancer patients (12.5%, 1/8 studies) (Pizzoli et al., 2019). The different results show that Virtual space in an artificial world is associated with an analgesic effect can significantly reduce the acute pain associated with treatments. There is no strong consensus on the most favorable duration of immersion.

Conclusion : The use of VR was shown to have potential effects on rehabilitation process in breast cancer patients. Currently, most of the collected results show a positive image of VR, so there is no doubt that the use of this technology is of great interest. However, regularly reported beneficial effects need to be understood in light of the characteristics of the technique used and according to patient specifics and preferences. Future studies will need larger sample sizes to examine the impact of VR-assisted rehabilitation on health outcomes in cancer patients.

Keywords : Virtual Reality, Rehabilitation, Cancer, Breast

Count: 264
Abstract ID: 212
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Imipramine increases hippocampal neurogenesis in an Alzheimer's rat model

Submission Author: Alireza Jamshidi Hasanabadi

Alireza Jamshidi Hasanabadi[1], Elmira Beirami[2], Delaram Eslimi Esfahani[3]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran

Background and Aim : Alzheimer is a common neurodegenerative disease with several pathophysiological effects. Imipramine as an antidepressant drug has antioxidant and anti-inflammatory effects in the central nervous system. The aim of this study was to investigate the protective effect of imipramine on hippocampal neurogenesis in the STZ-treated rats.

Methods : In this study, male Wistar rats were used, which were divided into 6 groups as follows: control, STZ, STZ with imipramine (10 or 25 mg/kg), and also groups that received only imipramine (10 or 25 mg/kg) without STZ. The Alzheimer Disease (AD) model was induced by intracerebroventricular (ICV) injection of STZ (3 mg/kg, 3μl, bilaterally). Intraperitoneal injection of imipramine was performed 1 h after ICV-STZ for 14 days. At the end, the rats were killed painlessly and their hippocampus was extracted to measure the genes expression involved in neurogenesis (DCX, Nestin, ki67) by Real-time PCR technique.

Results : The results showed that the expression of genes involved in hippocampal neurogenesis was significantly reduced in AD rats compared with control group, while treatment with imipramine, especially at the dose of 25 mg/kg, increased the expression of these genes in the STZ-treated rats.

Conclusion : Therefore, imipramine can be considered as a considerable treatment agent in increasing neurogenesis in AD patients.

Keywords : Alzheimer; imipramine; neurogenesis

Count: 265
Abstract ID: 205
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

REM Sleep behavioral disorder; A promising biomarker for neurodegenerative disease

Submission Author: Amin Haratian

Amin Haratian[1], Mohammadreza Ashayeri[2], Aida Hamedi[3], Soorin Sadat Faregh[4], Kataneh Abrari[5]

1. Department of Cell and Molecular Biology, Faculty of Biological Sciences, Kharazmi University, Tehran
2. Department of Cell and Molecular Biology, Faculty of Biological Sciences, Kharazmi University, Tehran
3. Department of Cell and Molecular Biology, Faculty of Biological Sciences, Kharazmi University, Tehran
4. Department of Cell and Molecular Biology, Faculty of Biological Sciences, Kharazmi University, Tehran
5. Department of Animal Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran

Background and Aim : During REM sleep, our muscles are paralyzed. If the temporary paralysis (atonia) of REM sleep is disturbed, one can physically act out dreams. This is called rapid eye movement (REM) sleep disorder. With this disorder, normal paralysis is not obtained. Patients with idiopathic REM-sleep behavior disorder (iRBD) are at substantial risk of progressive neurodegenerative disease of α-synuclein pathology. Longitudinal studies have demonstrated that abnormal α-synuclein deposition occurs early in the course of the disease and may precede the appearance of motor symptoms by several decades. Pathological synuclein is found in living IRBD patients.

Methods : Several studies using the anti-serine 129-phosphorylated antibody have shown that synuclein is detected in the peripheral nerves that reach peripheral organs. RBD is present in 25–58% of patients with Parkinson's disease and up to 90% of those with Dementia with Lewy Bodies (DLB) or Multiple System Atrophy (MSA). In a substantial proportion of these patients, RBD onset occurs before motor symptoms. Critically, when seen in isolation, RBD is a highly specific marker of future synucleinopathy: long-term cohort studies indicate that more than 80% of people who develop isolated RBD will develop an alpha-synuclein-related neurodegenerative disorder. Recently, the largest ever study of 1280 polysomnographically-diagnosed RBD subjects from 24 International RBD Study Group sleep centers by a single author group found an overall conversion rate from iRBD to an overt neurodegenerative syndrome of 6.3% per year.

Results : Experts have long argued that iRBD patients represent an earlier prodromal phase of the alpha-synuclein disorders, namely PD, DLB, and MSA. As the PD/DLB prodrome is up to 20 years in duration, and Parkinson's is a slowly progressive neurodegenerative disease, patients at the time of their diagnosis will have already been suffering neurodegeneration over the prior decade(s).

Conclusion : Arguably, as RBD subjects will be at a much earlier stage of the disease, neuroprotective treatment strategies that aim to cure or even slow down disease progression should be targeted at this prodromal group. It remains to be seen whether pharmaceutical or other interventions that improve sleep quality might in themselves modify or slow down established motoric or cognitive PD progression.

Keywords : REM; Parkinson's; α-synuclein; Dementia

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 266
Abstract ID: 203
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The effect of insulin on neurogenesis in a streptozotocin-induced Alzheimer's disease model

Submission Author: Zahra Eshrati

Zahra Eshrati[1], elmira beirami[2], Delaram Eslimi Esfahani[3]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) refers to cognitive deficit that causes a decline in thinking, reasoning, memory, and behavioral abilities. Several studies have shown that insulin plays an essential role in the brain functions. Also, studies showed reduced neurogenesis in the hippocampus of AD patients. The aim of this study was to evaluate the protective effect of intranasal insulin administration against neurogenesis impairment in a streptozotocin (STZ)-induced AD model.

Methods : To induce AD model, male Wistar rats were treated with intracerebroventricular (ICV) STZ (3 mg/kg, 3μl/hemisphere, bilaterally). Intranasal treatment with insulin (2IU/rat/day; 10 μl/nostril) was started 1 h after ICV-STZ and continued for 14 days. The gene expression of neurogenesis factors (Nestin, DCX, and Ki67) was detected by real-time quantitative polymerase chain reaction in the hippocampus of rats.

Results : Our results showed that ICV-STZ reduced neurogenesis in the hippocampus of AD rats. Interestingly, insulin treatment effectively increased the genes expression involved in neurogenesis in the STZ-treated rats.

Conclusion : These findings suggest that insulin can be considered as a therapeutic agent for treating or mitigating AD related neuropathology.

Keywords : Alzheimer's disease; Insulin;Neurogenesis; Rat

Count: 268
Abstract ID: 240
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Mesenchymal stem cells as a good candidate for gene therapy in multiple sclerosis treatment: A systematic review article

Submission Author: Maryam Azimzadeh

Maryam Azimzadeh[1], Reihaneh Seyedebrahimi[2]

1. Department of Medical Laboratory Sciences, Khomein University of Medical Sciences, Khomein, Iran
2. Department of Anatomical Sciences, School of Medicine, Qom University of Medical Sciences, Qom, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic inflammatory disease of the central nervous system (CNS) in which axonal damage occurs by multiple components including inflammatory cytokines, nitric oxide, proteases released from immune cells and eventually, induce oligodendrocyte loss and demyelination. Conducting of the MS treatment strategies can be provided using Disease-modifying treatments (DMTs). Although current drugs (e.g., Dimethyl fumarate, Interferon beta, Glatiramer acetate) reduce the activity of CNS inflammation and improve clinical symptoms in MS patients via mostly targeting of host immune cells, they are along with the dose-related adverse effects and insufficient remyelination. Mesenchymal stem cells (MSCs) are considered as a promising therapeutic in autoimmune diseases such as MS due to their immunoregulatory and neuroprotective effects. Clinically, gene therapy is a relatively efficient therapeutic approach in the different diseases which have been presented satisfactory feedback due to the long-term expression of therapeutic factors and targeting of the lesion site. In this regard, MSCs could serve as a beneficial vehicle in gene therapy for transferring of therapeutic agents to the injured sites. In this review, we describe the potential therapeutic effects of modified MSCs in terms of immunoregulatory, neuroprotective, and remyelinating functions for MS treatment.

Methods : Data gathering were accomplished by searches in PubMed and used from articles published English between 2018 and 2022 using the search keywords " Multiple sclerosis ", " Mesenchymal stem cells " and "Gene therapy".

Results : The results revealed that treatment with modified MSCs were association with high immunoregulation, potential remyelination, and neuroprotection in comparison with MSCs therapy in experimental models of MS

Conclusion : MSCs have the potent potential of immunoprotection and remyelination which are promising treatment strategies in MS disorder. To enhance the MSCs performance in autoimmune

diseases, these cells are genetically modified as carrier and secretor of the therapeutic cytokines, means gene therapy with MSCs. Despite the high efficiency of stem cell therapy and gene therapy with MSCs in MS disorder, there are barriers and limitations in this regard that need to be addressed to maximize outcomes.

Keywords : Multiple sclerosis (MS), Mesenchymal stem cells (MSCs), Gene therapy, Immunoregulation, Remyelination, Neuroprotection

Nanomedicines: A Hope for Treatment of Neurodegenerative Disease

Submission Author: Reihaneh Seyedebrahimi

Reihaneh Seyedebrahimi[1], Mohsen Eslami Farsani[2], Shima Ababzadeh[3]

1. Department of Anatomy, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran
2. Department of Anatomy, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran
3. 3. Department of Tissue Engineering, School of Medicine, Qom University of Medical Sciences, Qom, Iran

Background and Aim : There are many neurodegenerative diseases in central nervous system (CNS). These diseases include Alzheimer's disease, Parkinson's disease, Huntington disease (HD), Multiple sclerosis (MS), frontotemporal dementia (FTD), and etc that pathologies of neurodegenerative diseases mostly characterized by neuroinflammation, synaptic abnormalities, and neuronal death. The treatment of neurodegenerative diseases is problem due to CNS is unable to regenerate itself. So, the choice of suitable and effective treatment methods is necessary. Most of the drugs commonly administrated as oral or intravenous and these methods of administration have weak efficiency of brain targeting because presence of a physiological blood-brain barrier (BBB) prevents of reaching the therapeutic substances to target site in brain. However, with the advent of nanotechnology, new window was treated for diagnosis and treatment of diseases. The engineered nanoparticles with their small size and special properties, can specifically target the brain in various neurodegenerative disorders. In fact, those nanomaterials may directly cross of BBB or may improve the entrance of drugs and growth factors into the brain. The use of drug delivery system provides a constant release of drugs and other agents without more side effects compared to administration of agents only. The purpose of this review is to evaluate the effect of drug delivery systems on diagnosis and treatment of various neurodegenerative diseases.

Methods : In this study data were obtained by searches of Pub Med, web of Science, Scopus and Google scholar data bases and used from articles published in English between 2018 and 2022 using the search terms "nanomaterials", "neurodegenerative diseases" and "blood brain barrier". The collection of review articles included 28 articles, and finally, 11 articles were selected and used.

Results : The engineered nanoparticles of different materials including graphene, carbon nanotubes, silver, gold, polymeric and magnetic have unique properties such as high chemical and biological stability, possibility of combination hydrophilic and hydrophobic molecules, and

constant release of drugs in animal's models. Also, the drug delivery system can improve efficiency drugs and different agents in diagnosis and treatment of diseases.

Conclusion : The discussions presented in this study reveal that the different organic and inorganic nanoparticles can be as a suitable option in diagnosis and treatment of neurodegenerative disorders in animal, cell, and human modeling.

Keywords : Nanomedicine, Neurodegenerative diseases, Central neural system, Neuroinflammation

Count: 270
Abstract ID: 107
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Therapeutic effects of L-carnitine against an amyloid-bets induced rat model of Alzheimer's disease: a behavioral study.

Submission Author: Yekta Jahedi tork

Yekta Jahedi tork[1], Alireza komaki[2], Erfan naseri[3]

1. Neurophysiology Research Center, Hamadan University of Medical Science, Hamadan, Iran
2. Neurophysiology Research Center, Hamadan University of Medical Science, Hamadan, Iran
3. Neurophysiology Research Center, Hamadan University of Medical Science, Hamadan, Iran

Background and Aim : Alzheimer's disease (AD) is a neurodegenerative disease leading to cognitive and memory impairment. Beta-amyloid (Aβ) stimulates the types of activated oxygen and causes oxidative stress and the death of nerve cells. . L-carnitine is one of the effective compounds in mitochondrial function and energy production. This compound is found naturally in most tissues of the body, including the brain. The antioxidant function of this compound has been proven. It has been reported that carnitine compounds show protective effects for central and peripheral neurons. The ability of both compounds to reduce oxidative stress, DNA oxidative damage and lipid peroxidation can be the basis of their protective effect for neurons. The purpose of this research is to investigate the effect of L-carnitine on the process of memory and learning due to it's antioxidant and neuroprotective effects in Alzheimer's disease, so that if the result is positive, we can prevent the rapid progress of this disease affecting memory and learning.

Methods : The rats were randomly divided into four groups with ten rats in each group: control, , Alzheimer (ICV injection of Aβ solution), control+ (0.1 g/kg of L-carnitine), and treatment (0.1 g/kg of L-carnitine after the ICV injection of Aβ). The l-carnitine solution was administered for 30 days by oral gavage. Following treatments, the animal's learning and memory were investigated using passive avoidance learning (PAL) task, elevated plus maze , barnez maze, and novel object recognition (NOR) tests.

Results : The results of this study demonstrated that the intraventricular injection of beta amyloid A? caused a decrease in passive avoidance memory as well as spatial memory and new object recognition memory. Whereas, L-carnitine improved passive avoidance memory, new object recognition memory and spatial memory. The results of the elevated plus maze showed the anti-anxiety effect of L-carnitine and decrease in the time spent in the dark and administration of l-carnitine increased the discrimination index of the NOR test .

Conclusion : The findings of the present study demonstrate that l -carnitine can improve memory and learning impairment following Aβ infusion. These effects are likely due to the antioxidant properties of l -carnitine and its ability to scavenge free radicals.

Keywords : Alzheimer's disease;L-carnitine; Memory and learning; Rat

Count: 271
Abstract ID: 19
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Alzheimer's neuroprotective strategies through decreasing hyperphosphorylated tau; modulation of tauopathy via novel methods

Submission Author: Auob Rustamzadeh

Auob Rustamzadeh[1], Armin Ariaei[2]

1. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. School of Medicine, Iran University of Medical Sciences and Health Services, Tehran, Iran

Background and Aim : In our brain, many enzymes and proteins work together in order to make us conscious of everyday life. Among these proteins, tau is responsible for minor cellular activity but makes a significant impact when it changes to a pathological form. Tau is known to interfere with a wide range of enzymes and filaments.

Methods : We consider PRISMA guideline to perform a systematic review, in which high-impact articles, peer review journals, and relevant subjects in regard to our work were selected from Pubmed, Elsevier, and Web of Science with the search query of ((tau AND clearance) AND (residue OR phosphorylation)) in the title and abstract of the original and review articles. Moreover, the reference lists of relevant studies and reviews were scrutinized for possible additional studies.

Results : As a protein mainly involved in microtubule function has 87 phosphorylated sites in its longest isoform, 44 of which are observed to be phosphorylated both in normal and Alzheimer's disease (AD) groups but with a higher degree in AD. Since B-type lamins are crucial for genome modification and function, tauopathies resulted in lamin B malfunction and subsequent death of the neuron. The volume of nucleoli decreases and the transcription factor is inhibited as well as increasing DNA methylation, all of these incidents are hypothesized to be the result of impaired interaction between lamin and tau. There is also a bidirectional interaction between neural retrograde transport and tauopathy in which perturbation in retrograde transport elevates tau-induced toxicity, and tau dysfunction results in a decrease in transport efficiency. Deletion of kinesin-1 resulted in activating axonal stress kinase pathways, which results in tau hyperphosphorylation. Some enzymes are suggested for an abnormal activity involved in tauopathy, including GSK-3?, P38 MAPK, CK1 ?, PKA, PP1, PP2A, PP2B, and PP5. Therefore, using enzyme inhibitors is an alternative way to decrease phosphorylation degrees. These potential

inhibitors are listed as NAPVSIPQ (NAP), LiCl, and miRNA 326. miRNA 326 indirectly inhibits tau phosphorylating by using complex pathways, including insulin and the Jun N-terminal kinase (JNK) pathway. Immunotherapy is a simple way in which the patients' antibodies are used to mark p-tau to be later eliminated by the immune system. Tau acetylation and proteolysis targeting chimera (PROTAK) method as novel findings could help drug development for treating patients with tau-related diseases. At last, hyperphosphorylation in some residues has beneficial effects like phosphorylation of Ser305 and Tyr 310, which impact tau conformation and decrease tau aggregation.

Conclusion : Enzymes have an important part in tau activity. Hence, regulating enzymes by inhibiting or overexpressing is a key factor to change tau features. Overexpression of NAPVSIPQ can reduce phosphorylation. LiCl can inhibit kinase enzymes. MiR-326 can inhibit gene expression involved in the JNK pathway. FoxO1 can inhibit GSK-3β. Also, alternation in insulin and acetylation pathway have a positive effect on tau binding to microtubules. Moreover, phosphorylation of Ser305 and Tyr310 reduces tau aggregation. Finally, using the PROTAC method for eliminating the excess amount of tau lightens a new way with high efficiency.

Keywords : Tauopathy; Alzheimer; PROTAC method; Phosphorylation; Acetylation; Neuroprotection

Count: 272
Abstract ID: 68
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Reduction of alpha-synuclein level due to increased expression of miR-149-5p after CJ-MSCS transplantation in animal model of Parkinson's disease

Submission Author: Meysam Forouzandeh

Hossein Mostafavi[1], Meysam Forouzandeh[2], Elham Ghasemloo[3], Mohammad Reza Bigdeli[4], Samad Nadri[5], Mehdi Eskandari[6]

1. Department of Physiology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran.
2. Faculty of Life Sciences and Biotechnology, Shahid-Beheshti University, Tehran, Iran and Institute for Cognitive and Brain Science, Shahid Beheshti University, Tehran, Iran
3. Department of Physiology, School of Medicine, Zanjan University of Medical Science, Zanjan, Iran.
4. Faculty of Life Sciences and Biotechnology, Shahid-Beheshti University, Tehran, Iran
5. Department of Medical Nanotechnology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran
6. Department of Physiology, School of Medicine, Zanjan University of Medical Science, Zanjan, Iran.

Background and Aim : Parkinson's disease (PD) is a progressive neurodegenerative disorder that is caused by the destruction of dopaminergic neurons and the reduction of dopamine and leads to behavioral complications. One of the main characteristics of this disease is the presence of missfold alpha-synuclein (α-Syn) proteins, which causes the formation of intracellular masses and induction of neurotoxicity, and thus the consequences of PD, including the reduction of the expression of tyrosine hydroxylase (TH) and dopamine. Therefore, it seems that clearing these toxic proteins can be effective in improving the outcomes of PD. Cell therapy has been proposed as a promising method for the treatment of PD, among which mesenchymal stem cells (MSCs) have revealed more favorable effects. Studies have shown that there are mesenchymal stem cells in the eye conjunctiva that can express TH. Therefore, in this study, the effect of a new source of induced MSCs taken from eye conjunctiva (iCJ-MSCs) on α-Syn clearance by miR/Akt/mTOR pathway has been evaluated.

Methods : In this study, male Wistar rats were randomly divided into 4 groups: sham (without induction of PD and no treatment), model (induction of PD without treatment), Vehicle (induction of PD + injection of culture medium), iCJ-MSCs group (PD+ iCJ-MSCs transplant induction) and encapsulated iCJ-MSCs group (PD+ induction encapsulated iCJ-MSCs transplant) and induction of Parkinson's disease was done by 6-hydroxydopamine (6-OHDA) and by stereotaxic method,

and to confirm the modeling, the rotation test induced by apomorphine was used. After confirming the modeling, the labeled cells were transplanted into the right striatum of rats. Then, behavioral tests were performed in different weeks after transplantation and expression of miR-149-5p, Akt, mTOR and α-Syn genes by qRT-PCR were investigated.

Results : The results of the data analysis showed that the transplantation of cells led to a significant decrease in the number of rotations (p<0.01), an significant increase in balance (p<0.01) and movement coordination (p<0.01) of the rats compared to the model group. And these effect were significant (p<0.01) in capsulated iCJ-MSCs compared to non-capsulated iCJ-MSCs. The expression of miR-149-5p increased after cell transplantation (p<0.001) and the expression of Akt, mTOR and ?-Syn decreased significantly (p<0.001) compared to the model group. Also, capsulated induced cells compared to non-capsulated induced cells caused a significant change in the level of mentioned genes (p<0.01).

Conclusion : It seems that CJ-MSCs can exert protective effects on PD complications due to their ability to express genes related to dopamine and through the secretion of various factors, including miR-149-5p, activate the pathway related to clearing α-Syn and reduce neurotoxicity and thus exert their protective effect in PD. On the other hand, neural induction of cells and their microencapsulation lead to strengthening the protective effect of CJ-MSCs.

Keywords : Parkinson's disease, Conjunctival Mesenchymal Stem Cells, Alpha-Synuclein, microRNA, Stem Cell Therapy

Count: 273
Abstract ID: 123
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Gold nanoparticles in the diagnosis and treatment of neurodegenerative diseases

Submission Author: Touraj Naderi

Touraj Naderi[1], Fatemeh Ghoveisi[2], Zahra Hajjari[3]

1. Department of Biology, University Nagheshejahan, Esfahan, Iran
2. Department of Biology, University Nagheshejahan, Esfahan, Iran
3. Department of Biology, University Nagheshejahan, Esfahan, Iran

Background and Aim : The most common neurodegenerative disorders nowadays, such as Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis, can be classified as proteinopathies. They can be either synucleinopathies, amyloidopathies, tauopathies, or TDP-43-related proteinopathies thus, nanoparticles with a potential ability to inhibit pathological protein aggregation and degrade already existing aggregates can be a promising approach in the treatment of neurodegenerative disease. Furthermore, the overall fertility has dropped and these two factors contribute to the aging of the society. Due to this phenomenon, the increase in prevalence of neuro degenerative diseases is predicted to be more visible in the future than it currently is. First of them and the most common one is Alzheimer's disease (AD), which affects approximately 30% of people aged 85 or older. The second most common is Parkinson's disease (PD), which affects 10-15 per 100 000 people annually. Subsequently, amyotrophic lateral sclerosis's (ALS) annual incidence is approximately 1-2.6 new cases per 100 000 persons.

Methods : Keywords were searched in the Google and PubMed database to find documents related to writing a review article.

Results : the most classical feature of all these diseases is protein misfolding in specific brain regions thus, these disorders can be classified as proteinopathies. Protein Aggregation in Neurodegeneration A body of evidence suggests that the accumulation and trans-mission of ?-synuclein (?-syn) aggregates in the midbrain are highly associated with the pathogenesis of PD .?-Synuclein is a presynaptic protein, which probably plays a regulatory function in modulation of synaptic plasticity, control of presynaptic vesicle pool size, release of neurotransmitters, and vesicle recycling. Its structure can be divided in to three regions: an amphiphilic N-terminus, an acidic C-terminus, and a hydrophobic central domain, which is known as the nonamyloid?component (NAC). Graphene quantum dots (GQDs) are less than 100 nm in size and

are made of single-or few-layer graphene. They have been widely used in nano biomedicine by virtue of their low cytotoxicity and high biocompatibility. Dendrimers are highly branched, tree-like polymers with unique properties thanks to their terminal functional surface groups. The dendrimers inhibit formation of ?-sheet structures and disrupt remaining?-sheets or the agglomerates, in concentration and generation axis. Gold nanoparticles (AuNPs) have been extensively used in biomedicine because of their great biocompatibility, chemical inertness, and effortless size control. AuNPs are also able to abrogate aggregation of pathological proteins. Nevertheless, they may be toxic, toxicity of gold NPs significantly depends on their size, charge, and coating.

Conclusion : GNPs with a size of 3–4 nm exhibited the best inhibition efficiency and protective effect of neurons against amyloid-β (Aβ)42 aggregate-induced cellular toxicity. GNPs synthesized from the root extract of Paeonia moutan (PM-AuNPs) showed in vitro results where PM-AuNPs efficiently scavenge the ROS and decrease the levels of inflammatory cytokines in microglial cells. In addition, in vivo results confirmed that PM-AuNPs treatment prevented dopaminergic neuro inflammation and increased the levels of dopamine, thereby protecting PD-induced mice from motor disorders.

Keywords : neurodegenerative disorder; Nanotechnology; Gold nanoparticle

Identification of RNF13 as cause of recessively inherited ALS in a multi-case pedigree

Submission Author: Marzieh Khani

Marzieh Khani[1], Elahe Elahi[2], Shahriar Nafissi[3], Hosein Shamshiri[4], Hamidreza Moazzeni[5], Hanieh Taheri[6]

1. School of Biology, College of Science, University of Tehran, Tehran, Iran
2. School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Department of Neurology, Tehran University of Medical Sciences, Tehran, Iran
4. Department of Neurology, Tehran University of Medical Sciences, Tehran, Iran
5. School of Biology, College of Science, University of Tehran, Tehran, Iran
6. School of Biology, College of Science, University of Tehran, Tehran, Iran

Background and Aim : Amyotrophic lateral sclerosis (ALS) is the most common motor neuron disease. The approximately 50 known ALS-associated genes do not fully explain its heritability, which suggests the existence of yet unidentified causative genes. We report results of studies aimed at identification of the genetic cause of ALS in a pedigree (three patients) without mutations in the common ALS-causative genes.

Methods : Clinical investigations included thorough neurological and non-neurological examinations and testings. Genetic analysis was performed by exome sequencing. Functional studies included identification of altered splicing by PCR and sequencing, and mutated proteins by western blot analysis. Apoptosis in the presence and absence of tunicamycin was assessed in transfected HEK293T cells using an Annexin-PE-7AAD kit in conjunction with flow cytometry.

Results : ALS diagnosis of examined patients was based on El Escorial criteria. Disease progression in the patients of the pedigree was relatively slow and survival was relatively long. An RNF13 mutation was identified as the cause of the recessively inherited ALS in the pedigree. The gene is highly conserved, and its encoded protein (RING finger protein 13) can potentially affect various neurodegenerative-relevant functions, including protein homeostasis. The RNF13 splice site mutation caused expression of two mis-spliced forms of RNF13 mRNA and an aberrant RNF13 protein, and affected apoptosis.

Conclusion : RNF13 was identified as a novel causative gene of recessively inherited ALS. The gene affects protein homeostasis, which is one of most important components of the pathology of neurodegeneration.

Keywords : Amyotrophic lateral sclerosis; ALS; Exome sequencing; Protein homeostasis; RNF13

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Neuroprotective effect of geraniol on neurological disorders: a review article

Submission Author: Shekofeh Bagheri

Shekofeh Bagheri[1], Alireza Komaki[2]

1. Ph.D. Student of Neuroscience, Department of Neuroscience, School of Sciences And Advanced Technologies In Medicine, Hamadan University of Medical Science, Hamadan, Iran, Shekofe0@gmail.com
2. Professor of physiology, Department of Neuroscience, School of medicine, Hamadan University Of Medicakl sciences, Hamadan, Iran, alirezakomaki@gmail.com

Background and Aim : Neurological disorders are structural, biochemical, and electrical abnormalities that afect the peripheral and central nervous systems. Paralysis, muscle weakness, tremors, spasms, and partial or complete loss of sensation are some symptoms of these disorders. Neurorehabilitation is the main treatment for neurological disorders. Treatments can improve the quality of life of patients. Neuroprotective substances of natural origin are used for the treatments of these disorders

Methods : Online databases, such as Google Scholar, PubMed, ScienceDirect, and Scopus were searched to evaluate articles from 1981-2021 using the Mesh words of geraniol (GER), neurological disorders, epilepsy, spinal cord injury (SCI), Parkinson's diseases (PD), and depression. A total of 87 studies were included in this review.

Results : GER with antioxidant, anti-infammatory, and neuroprotective efects can improve the symptoms and reduce the progression of neurological diseases. GER exhibits neuroprotective efects by binding to GABA and glycine receptors as well as by inhibiting the activation of nuclear factor kappa B (NF-κB) pathway and regulating the expression of nucleotide-binding oligomerization of NLRP3 infammasome. In this study, the efect of GER was investigated on neurological disorders, such as epilepsy, SCI, PD, and depression

Conclusion : Although the medicinal uses of GER have been reported, more clinical and experimental studies are needed to investigate the effect of using traditional medicine on improving life-threatening diseases and the quality of life of patients.

Keywords : Neurological disorders · Epilepsy · Spinal cord injury · Depression · Parkinson diseases · Geraniol

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

An umbrella review of systematic reviews with meta-analysis on the role of vitamins in Parkinson's disease

Submission Author: Sama Rahnemayan

Sama Rahnemayan[1], Sasan Ghazanfar Ahari[2], Reza Rikhtegar[3], Sevda Riyahifar[4], Sarvin Sanaie[5]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Institute of Diagnostic and Interventional Radiology and Neuroradiology, Faculty of Medicine, University Duisburg-Essen, Duisburg, Germany.
4. Department of Biostatics, School of Public Health, Iran University of Medical Sciences, Tehran, Iran.
5. Research Center for Integrative Medicine in Aging, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran.

Background and Aim : This umbrella review aimed to systematically review the available literature and assess the association of dietary intake or serum levels of different vitamins and the risk of PD, to help find out more efficient treatments for PD patients by replenishing the deficiency of vitamins.

Methods : Pubmed/Medline, Scopus, Google Scholar and hand searching bibliographies of retrieved articles in duplicate, were used to detect all relevant meta-analyses investigating the relationship between vitamins and PD. 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 $P \leq 0.05$.

Results : 14 meta-analyses were included in the meta-review. 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 : Serum vitamin D and B12 levels were significantly lower in PD in comparison to healthy individuals, while Hcy level was significantly higher in PD patients. Also higher vitamin E intake was associated with significantly lower risk of development of PD in comparison to lower vitamin E intake. However, there was no significant difference between risk of PD and higher vitamin A, C and B6 intake or serum levels of folate.

Keywords : Antioxidants; Parkinson's disease; Vitamins

Count: 277
Abstract ID: 35
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

Arezoo Fathalizadeh[1], Sarvin Sanaie[2], Mojgan Mirghafourvand[3], Anita Reyhanifard[4], Sama Rahnemayan[5], Ata Mahmoodpoor[6], Elnaz Faramarzi[7]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Neurosciences Research Center, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Social Determinants of Health Research Center, Midwifery Department, Tabriz University of Medical Sciences, Tabriz, Iran.
4. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
5. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
6. Anesthesiology and Critical Care Department, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran.
7. Liver and Gastrointestinal Diseases Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

Background and Aim : Parkinson's disease (PD) ranks the second most prevailing progressive nervous system disease. Despite the significance of heredity and related factors, notably in early-stage manifestations, the effect of lifestyle and other environmental factors should not be neglected in PD occurrence and degeneration. Accordingly, there is a globally recognized epidemiological link between smoking and PD. While nicotine is believed to be an effective substance in this regard, passive smoking and dietary nicotine may have the same effect on PD. 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 study implemented Q-statistic to investigate the selected papers based on statistical heterogeneity.

Results : In total, four cohorts and five case-control papers were included. Our findings indicated that life time exposure to smoking had protective effect against PD risks (OR: 0.84; 95% CI: 0.70-0.99; p=0.04). However, 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; dietary nicotine

Count: 278
Abstract ID: 38
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Nano curcumin drug effect on prevention and treatment of Alzheimer's disease

Submission Author: Leili Sharif Bakhtiar

Leili Sharif Bakhtiar[1], Parya Kamali[2], Zeinab Mohammadi[3], Sheedeh Sharif Bakhtiar[4], Mahsa Dokhaei[5]

1. Department of Biochemistry, Protein Research Institute, Shahid Beheshti University
2. Department of Biochemistry, Protein Research Institute, Shahid Beheshti University
3. Department of Genetics, Tehran Medical Sciences, Islamic Azad University
4. Department of Mathematics and Computer Science, Shahid Beheshti University
5. Department of Cellular and molecular Biology, Tehran Medical Sciences, Islamic Azad University

Background and Aim : Alzheimer's disease (AD), is a widespread progressive neurodegenerative disorder. until now there is no effective treatment for the disease. about 60-70% of all cases of global dementia, are Alzheimer type. it is estimated by 2050, new cases of AD will be added every 33 seconds. Alzheimer's symptoms are highly associated with memory loss and Cognitive impairment. Indeed there is a growing necessity for the prevention and treatment of Alzheimer's disease. AD has pathological biomarkers which mainly are determined as Amyloid-β and tau protein. Currently, several drugs are prescribed for treating Alzheimer's. But these chemical drugs can improve the number of ADs symptoms for a certain duration without having promising efficiency in curing the disease. Today comprehensive studies have shown, that using natural and synthetic agents, has therapeutic advances in curing neurodegenerative diseases. Curcumin is one of the natural ingredients which can prevent the aggregation of Amyloid-β and tau protein. However, due to its short half-life in plasma, low absorption, and very poor solubility, the conformation of new complexes with natural ingredients and nanomaterials are emerging approaches for improving drug efficacy. Curcumin-nano formulations have massive therapeutic efficacy and prevention properties, against various neurodegenerative diseases. In this approach, the aim is to explain and propound the curcumin-nano complex features in Alzheimer's disease treatment.

Methods : For this review, efficient data, from PubMed, Scopus, Elsevier, Web of Science, and Science Direct, on molecular mechanism and pharmacological studies of natural curcumin and its nano curcumin form, were collected. For searching curcumin and nano drug impact on Alzheimer's disease, we used the following Mesh terms: "Curcumin", "nano drug delivery

"neurodegenerative", "Alzheimer", "Beta Amyloid", "Tau protein", "Anti-inflammatory" and "nano complex". We gathered vulnerable data from clinical, preclinical, in-vitro, and in-vivo studies to determine the impact of nano curcumin drugs on treatment and biomarkers of Alzheimer's disease.

Results : The results are obtained based on various in vitro, preclinical and clinical studies on curcumin-nano drug delivery in Alzheimer's disease, pointing out that curcumin- nano drug complexes have a different and positive impact on curcumin's outcome, which decreases the AD's biomarkers and increases the efficiency of drug-delivery.

Conclusion : The comprehensive systematic review presented in this paper confirms that curcumin and nano complexes, reduce AD's biomarkers aggregation. However, further clinical studies are needed to introduce the best formulation for the Curcumin-nano drug complex. The safety and efficiency of the complexes can be confirmed by more clinical trials.

Keywords : Curcumin-Alzheimer-Beta Amyloid-Tau protein-nano complex

Count: 279
Abstract ID: 277
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Transplanted mesenchymal stem cells improved short-term memory in rat model of Alzheimer's disease

Submission Author: Hoda Parsa

Hoda Parsa[1], Ahmad Ali Moazedi[2], Elham Hoveizi[3]

1. Department of Biology, Faculty of Science, Shahid Chamran University of Ahvaz,Ahvaz, Iran
2. Department of Biology, Faculty of Science, Shahid Chamran University of Ahvaz,Ahvaz, Iran
3. Department of Biology, Faculty of Science, Shahid Chamran University of Ahvaz,Ahvaz, Iran

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 : In this study 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 destroyed bilaterally with an electrical lesion (0.5 mA for 3 s) in 3th and 4th groups. Sham underwent surgery with no electrical lesion. One week after the bilateral lesion of the NBM, the mesenchymal cells (0.1 mL) were injected with stereotaxic surgery using a Hamilton syringe at NBM and after three weeks short term memory was study by using shuttle box apparatus.

Results : our results showed significant impairment of short-term memory (p<0.01) after electrical lesion in Alzheimer's group in compare with control and sham. Transplantation of stem cells improved short-term 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 cells, short-term memory, Alzheimer's disease

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Intranasal insulin treatment increases mitochondrial biogenesis in streptozotocin-induced Alzheimer's rats

Submission Author: Faeghe Shahrezaee

Faeghe Shahrezaee[1], Elmira Beirami[2], Delaram Eslimi Esfahani[3]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran

Background and Aim : Insulin, as a peptide hormone, has recently gained attention for its anti-inflammatory and neuroprotective effects in the central nervous system (CNS). Alzheimer's disease (AD) is a progressive neurodegenerative disease most often associated with memory deficits and cognitive decline. Mitochondrial dysfunction has been reported as an early and prominent feature of AD. The present study aimed to examine whether intranasal insulin administration with high CNS bioavailability and minimal systemic side effects, can affect mitochondrial biogenesis in streptozotocin (STZ)-treated rats.

Methods : In male wistar rats, STZ was administrated through the intracerebroventricular (ICV) injection (3mg/kg, 3μl, bilaterally). Intranasal insulin treatment (2IU/rat/day; 10 μl/nostril) was performed daily for 14 days 1 hour after ICV injection of STZ. The expression of genes involved in mitochondrial biogenesis (PGC-1α, NRF-1, and TFAM) was evaluated using quantitative polymerase chain reaction in the hippocampus of rats.

Results : our results indicated that ICV injection of STZ reduced mitochondrial function by decreasing the genes expression involved in mitochondrial biogenesis, while intranasal insulin treatment increased the expression of these genes in the hippocampus of Alzheimer's rats.

Conclusion : These findings introduce insulin as a potential therapeutic agent for the treatment of AD aversive symptoms.

Keywords : Intranasal insulin, Streptozotocin, Alzheimer, Mitochondrial biogenesis

Count: 281
Abstract ID: 295
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The effect of imipramine on the gene expression of factors involved in mitochondrial biogenesis in Alzheimer's disease model rats

Submission Author: Mehdi Kamaei

Mehdi Kamaei[1], Elmira Beirami [2], Delaram Eslimi Esfahani [3]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is one of the most prevalent neurodegenerative diseases, characterized by impaired cognitive function due to progressive loss of neurons in the brain. Although the exact mechanism of AD pathogenesis is still unknown, a large body of evidence suggests that damaged mitochondria likely play fundamental roles in the pathogenesis of AD. Imipramine, a tricyclic antidepressant, has been reported to have anti-inflammatory and antioxidant effects in human and animal studies. The aim of this study was to investigate the effect of imipramine on mitochondrial biogenesis in AD model rats.

Methods : The Alzheimer's model was induced by intracerebroventricular injection of STZ (3 mg/kg, 3μl, bilaterally) to male Wistar rats. After confirming this model using behavioral tests, intraperitoneal injection of imipramine was performed one hour after intracerebroventricular injection of STZ for 14 days in two doses of 10 or 25 mg.kg. At the end, the animals were killed painlessly and the expression of genes involved in mitochondrial biogenesis (PGC-1α, NRF-1, and TFAM) was evaluated using quantitative polymerase chain reaction in the hippocampus of rats.

Results : The results showed that imipramine treatment, especially at the dose of 25 mg/kg, increased the gene expression of factors involved in mitochondrial biogenesis in the hippocampus of Alzheimer's rats.

Conclusion : The results of this research introduce imipramine as a promising therapeutic agent to overcome AD aversive symptoms.

Keywords : Alzheimer's disease, Imipramine, Mitochondrial biogenesis

Count: 282
Abstract ID: 222
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Effects of Incensole Acetate on Neuro-inflammation, Brain-Derived Neurotrophic Factor and Memory Impairment Induced by Lipopolysaccharide in Rats

Submission Author: Narges Marefati

Narges Marefati[1], Hassan Ghoshooni[2], Mahmoud Hosseini[3]

1. Department of Physiology and Medical Physics, Faculty of Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran
2. Department of Physiology and Medical Physics, Faculty of Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran
3. Division of Neurocognitive Sciences, Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Incensole acetate (IA) is a major component of Boswellia serrata resin that has been shown to have anti-inflammatory, anti-oxidant and neuroprotective properties. The present study determined the effect of IA on lipopolysaccharide (LPS)-induced memory impairment, and hippocampal cytokines and oxidative stress indicators level.

Methods : We used 32 Wistar rats (220–250 g weight) randomly divided into four groups. The control group, which only received the saline-diluted DMSO (vehicle); LPS group which received LPS and was treated with the vehicle; and two IA-treated groups which received 2.5 or 5 mg/ kg IA before LPS injection. Morris water maze (MWM) and passive avoidance (PA) tests were performed. Finally, the brains were removed and were used to assess cytokines levels and oxidative stress status.

Results : Compared to the LPS group, IA administration reduced the time spent and path traveled to reach the hidden platform during 5 days of learning in MWM while increased the time spent in the target quadrant in the probe test. Moreover, IA increased latency while decreased entry number and time spent in the dark chamber of PA test compared to the LPS group. Additionally, pre-treatment with IA attenuated interleukin(IL)-6, tumor necrosis alpha (TNF-α), glial fibrillary acidic protein (GFAP), malondialdehyde (MDA) and nitric oxide (NO) metabolites levels while increased those of IL-10, total thiol, superoxide dismutase (SOD), catalase (CAT) and brain-derived neurotrophic factor (BDNF).

Conclusion : Our results indicated that IA improved LPS-induced learning and memory impairments. The observed effects seem to be mediated via a protective activity against neuro-inflammation and brain tissue oxidative damage and through improving BDNF.

Keywords : Incensole acetate · Memory · Inflammation · Brain-derived neurotrophic factor

PLGA-Based nano-drug delivery system; A promising therapeutic approach for Alzheimer's disease

Submission Author: Mina Hosseinzadeh

Mina Hosseinzadeh[1], Amin Haratian[2], Farima Farajollahi[3]

1. Department of Biology, Faculty of Basic Sciences, University of Kharazmi, Tehran, Iran
2. Department of Biology, Faculty of Basic Sciences, University of Kharazmi, Tehran, Iran
3. Department of Biology, Faculty of Basic Sciences, University of Kharazmi, Tehran, Iran

Background and Aim : Nanotechnology and nanomedicine evolved exponentially in recent years and presented a panoply of tools projected to improve the diagnosis and treatment of neurodegenerative diseases (NDD). Arguably, the best benefit of nanotechnology is that it enables us to deliver drugs beyond the blood-brain barrier. Among polymeric nanoparticles (PNPs), the most widely used is poly(lactic-co-glycolic) acid nanoparticles (PLGA NPs). This FDA-approved copolymer is a highly investigated polymer due to its ability to form nanoparticles (NPs), micelles, and microspheres, as it possesses the properties of biocompatibility, biodegradability, and tolerability.

Methods : Here we provided a brief review of original studies addressing therapeutic methods based on PLGA nanoparticles.

Results : Two strategies can be considered with PLGA NPs for NDD therapy: active substances by themselves and cargos for neuroprotective drugs. Various techniques, e.g., stereotaxic surgery, intranasal routes, enteral and parental, have been researched. Recent study suggests that PLGA without any drug/agent (native PLGA) can suppress amyloid ? aggregation/toxicity and influence the expression of Alzheimer's disease (AD)-related genes/proteins, highlighting PLGA's implication in routine and AD-related pathology. Another group of researchers loaded PLGA nanoparticles with Huperzine A (HupA), leading to impressive results. They achieved producing NPs that had a particle size of 153.2 ± 13.7 nm, polydispersity index of 0.229 ± 0.078, a zeta potential of $+35.6\pm5.2$ mV, drug entrapment efficiency of $73.8\%\pm5.7\%$, and sustained release in vitro over a 48h period. These NPs showed lower toxicity in the 16HBE cell line compared with the HupA solution. Noteworthy, a significant amount of NPs successfully crossed the blood-brain barrier and targeted the desired cells.

Conclusion : Blood-brain barrier crossing or the potential degradation of neuroprotective substances remain strategic points needing to be overcome for NDD treatments. In this context, PLGA NPs are a promising approach for new therapeutics. Some challenges remain regarding the biological (i.e., biological barrier breaching), technological (i.e., scale-up synthesis), and study design (i.e., data treatment) levels, which impact the potential clinical trials of PLGA NPs.

Keywords : Nanoparticles; PLGA; Alzheimer's; Blood-brain barrier

Count: 284
Abstract ID: 282
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Interferon beta enhances recognition memory performance of Alzheimer's disease rat model via mitochondrial biogenesis regulation

Submission Author: Sara Chavoshinezhad

Sara Chavoshinezhad[1], Forouzan Azarafrouza[2], Mohsen Farhangian[3], Leila Dargahi[4], Saina Dargahi[5], Marjan Nassiri-Asl[6]

1. Cellular and Molecular Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran.
2. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Neurobiology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
5. Student Research Committee, Shahid Beheshti University of Medical Sciences, Tehran, Iran
6. Department of Pharmacology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is the most common progressive neurodegenerative disorder clinically characterized by irreversible cognitive deficits and neuropathologically by the presence of extracellular β-amyloid (Aβ) plaques and intracellular neurofibrillary tangles (NFTs). In the brain, mitochondrial biogenesis is involved in neuroplasticity, neuronal viability, and memory performance. Impaired mitochondrial biogenesis has been detected in the AD brains and are correlated with cognitive deficits. Thus, strategies to stimulate mitochondrial biogenesis can alleviate AD symptoms. Interferon beta (IFNβ) is a cytokine with anti-apoptotic and anti-inflammatory properties. In previous studies, we found that treatment with intranasal (IN) IFNβ improves passive avoidance learning and spatial memory in rats with AD, at least partly by reduction of Aβ plaque accumulation, inhibition of apoptosis, and neuroinflammation as well as modulation of neurogenesis. This study is designed to investigate if IN administration of IFNβ can improve recognition memory performance in a rat model of AD by activation of mitochondrial biogenesis in the hippocampus.

Methods : The lentiviruses expressing mutant human amyloid precursor protein were injected bilaterally to the rat hippocampus. From day 23 after virus injection, rats were intranasally treated with recombinant IFNβ protein (68,000 IU/rat) every other day until day 50. Recognition memory performance was evaluated by novel object recognition test on days 46-49. The expression of

mitochondrial biogenesis markers including PGC-1α, NRF1, and TFAM were measured by real-time PCR in the hippocampus.

Results : Our results showed that IFNβ treatment improves recognition memory performance in parallel with increased mRNA expression of PGC-1α, NRF1, and TFAM in the hippocampus of the AD rats.

Conclusion : Taken together, our findings suggest the therapeutic potential of IFNβ for AD.

Keywords : Interferon-beta; Alzheimer's disease; Recognition memory; Mitochondrial biogenesis

Count: 285
Abstract ID: 383
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Intranasal administration and homing of super paramagnetic iron oxide nanoparticles (spions) labeled olfactory ensheathing cells by magnetic attraction in a rat model of demyelination

Submission Author: Marzieh Darvishi

Marzieh Darvishi[1]

1. Department of Anatomy, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran.

Background and Aim : Stem cell therapies for neurodegenerative diseases such as Multiple Sclerosis (MS) are intended to replace damaged neuronal architecture and function. The basis of this medicine is to conduct the migration of transplanted cells into the injury site. This study aims to assess intranasal administration and homing of superparamagnetic iron oxide nanoparticles (spions) labeled olfactory ensheathing cells (OECs) by external magnetic attraction in a rat model of demyelination.

Methods : OECs were received from olfactory mucosa and lamina propria of the olfactory mucosa (LP-OECs)of male adult rats and cultured in a DMEM medium. OECs markers were assessed by immunostaining with SOX10, S100 and CD45. The SPION was coated using poly-L-lysine hydrobromide, and transfection was defined in rat OECs using the GFP reporter gene. For this in vivo study, rats with demyelination (coprizon 2%)were divided into five groups: a positive control group, a control group Coprizon, and three treatment groups: the Coprizon/OECs group (demyelination models transplant with OECs transfected by BrdU), Coprizon/OECs /SPION group (demyelination rats transplant with OECs labeled with SPION and transfected by GFP), and the Coprizon/OECs /SPION/EM group (demyelination rats transplant with OECs labeled with SPION and transfected by GFP induced with external magnet). Transplantation performs by the intranasal procedure in all of the study groups.

Results : OECs were immunoreactive to markers S100 (73.73±1.7) and SOX10 (81.4±2.9), with negative immunostaining at the hematopoietic stem cell marker (CD45: 2.1±0.4). The efficiency of cells with SPION/PLL was about 87% OECs. The highest number of GFP-positive cells was in the OECs /SPION/EM group (61.5±1.3), which was significantly different from that in OECs /SPION group (48.83±3 and P<0.01).

Conclusion : Transfection of OECs by SPION/PLL is a suitable protocol for cell treatment. Intranasal administration is a non-invasive and effective alternative for delivering OEC transfected by SPION/PLL. External magnets can be used to deliver and homing of transplanted stem cells into the injury site.

Keywords : olfactory ensheathing cells (OECs), superparamagnetic iron oxide nanoparticles, homing, and stem cell therapy

Count: 286
Abstract ID: 381
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Effect of Icariin on Histological and Behavioral Impairment in Model of Demyelination (Multiple sclerosis) in mice C57BL/6

Submission Author: Elahe Abdi bastami

Elahe Abdi bastami[1]

1. Isfahan Neurosciences Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Icariin, a natural combination extracted from Epimedii herba, is known because of its anti-inflammatory and antioxidant effects. In this regard, studies demonstrate its potential as a natural compound against neurodegenerative diseases. The current study investigated a demyelination model's histological and functional changes related to Icariin treatment in C57BL/6 mice.

Methods : In the present study, 28 C57BL/6 mice were classified randomly into four groups: sham, cuprizone (0.2%), Icariin, and cuprizone plus Icariin. One week after treatment, gliosis, apoptosis, and remyelination were investigated histologically, and the behavioral test evaluated locomotor function.

Results : The expression of GFAP and caspase-3 in the untreated controls had the highest immunofluorescence while significantly diminished in the Icariin groups ($P<0.05$). The lowest expression of these two markers was observed in the cuprizone plus Icariin group, which also had the highest expression of MBP. Behavioral tests showed that mice in the cuprizone plus Icariin attained the highest score and the histological examination results agreed with the behavioral test outcomes.

Conclusion : The finding indicated an improvement in the demyelination models of mice treated with an Icariin, characterized by an upsurge in remyelination and an increase in the behavioral score.

Keywords : Icariin, cuprizone, GFAP, caspase-3, Demyelination (Multiple sclerosis)

Count: 287
Abstract ID: 385
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Evaluation of the association between the serum levels of glucose and free fatty acids with 6- hydroxydopamine- induced Parkinsonism in rats

Submission Author: Ali Sarbazi

Ali Sarbazi[1], Hashem Haghdoost-Yazdi [2], Hossein Piri[3], Monirsadat Mirzadeh[4]

1. Metabolic Diseases Research Center, Research Institute for prevention of Non- Communicable Disease, Qazvin University of Medical Sciences, Qazvin, Iran
2. Cellular and Molecular Research Center, Research Institute for Prevention of Non- Communicable Disease, Qazvin University of Medical Sciences, Qazvin, Iran.
3. Cellular and Molecular Research Center, Research Institute for Prevention of Non-Communicable Disease, Qazvin University of Medical Sciences, Qazvin, Iran
4. Metabolic Diseases Research Center, Research Institute for prevention of Non- Communicable Disease, Qazvin University of Medical Sciences, Qazvin, Iran

Background and Aim : There have been several reports of impaired glucose and fatty acid metabolism in people with Parkinson's disease. In this study, in order to further investigate the relationship between destruction of dopaminergic neurons in the corpus luteum and glucose metabolism, serum glucose levels and free fatty acids were investigated in an animal model of 6-hydroxydopamine (6-OHDA) of Parkinson

Methods : 6-OHDA was injected into the medial forebrain bundle and behavioral tests were performed up to eight weeks later. Blood samples were collected before the toxin injection and in the second and eighth weeks after the injection, and then the rat brains were perfused to evaluate the survival of dopaminergic cells in the substantia nigra. Glucose was measured using a calorimetric method and free fatty acids were measured using a kit by calorimetric method.

Results : No difference in glucose levels was observed between the experimental groups in the second week, but in the eighth week, glucose and fatty acid levels in rats receiving the 6-OHDA were lower than the sham group. Based on the severity of behavioral symptoms, rats receiving the toxin were divided into two subgroups: symptomatic and asymptomatic. Survival of dopaminergic neurons in symptomatic subgroups was 83 ± 16 and asymptomatic was $45\pm10\%$ lower than control group. There was no difference in glucose and fatty acid levels between the two subgroups. On the other hand, the decrease in weight gain of rats during the study period in the symptomatic subgroup was greater than the asymptomatic subgroup.

Conclusion : . Our data show that serum glucose and fatty acid levels decrease following the chronic and progressive death of dopaminergic neurons in the substantia nigra. However, there was no direct relationship between the death rate of dopaminergic neurons and the reduction rate of these two substances.

Keywords : Parkinson's disease, Free fatty acids, Glucose, 6-hydroxydopamine

Count: 288
Abstract ID: 457
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigating the long-term effects of curcumin and Nisome curcumin on the alteration of TLR4 gene expression and memory & learning in Alzheimer's rats

Submission Author: Elahe Asani

Elahe Asani[1], Homeira Hatami[2], Somayeh Hatami [3]

1. M.Sc. Student of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Associate Professor of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. Ph.D. student in Animal Physiology, Department of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran

Background and Aim : Alzheimer's is a neurodegenerative disease. Amyloid-beta deposition in the brain and neuroinflammation, oxidative stress play an important role in Alzheimer's pathogenesis. Exposure to aluminum chloride increases the expression of the TLR4 gene (one of the main factors of the inflammatory pathway) and causes neuroinflammation and Alzheimer's. To deal with these effects, the use of antioxidants is recommended. Curcumin is an antioxidant that reduces oxidative stress and neuroinflammation, thereby improving neurological disorders such as Alzheimer's. But curcumin has little bioactivity, and to solve this problem, nanoparticles such as Niosome have been used, which cross the blood-brain barrier faster than simple antioxidants and improve neuroinflammation and neurological disorders. In this study, the long-term antioxidant effect of curcumin and curcumin Niosome was investigated on the change of TLR4 gene expression as well as on memory and learning of Alzheimer's rat using the novel object recognition test (NORT).

Methods : In this study, 56 Wistar male rats were randomly divided into 3 groups (n=8): 1) Control (28 days of saline) , 2) Sham (14 days of ethanol), 3) Aluminum chloride (Alzheimer's) (4/2mg/kg; 28 days), 4) Alzheimer's + Curcumin, 5) Curcumin (20mg/kg; 14 days), 6) Niosome Curcumin(20mg/kg; 7 days), 7) Alzheimer's + Niosome Curcumin. (Injection of drugs was intraperitoneal). Memory and learning were evaluated on the 14th day by the discrimination index (d2) parameter with the object recognition test, and after receiving the treatment, the animals were decapitated and their frontal cortex were removed, and the expression of TLR4 gene assayed using RT- PCR. One-way ANOVA were used for data analyzing.

Results : In NORT, a significant increase in d2 was found in Alzheimer's+Niosome Curcumin and Alzheimer's+Curcumin and Niosome Curcumin and Curcumin groups compared to Alzheimer's group and the Alzheimer's group had a significant decrease compared to the control and sham groups (p<0/0001). There is no significant difference between Alzheimer's+ curcumin, Alzheimer's+ Niosome Curcumin and Niosome Curcumin groups compared to Curcumin group (p>0/05). TLR4 gene expression was significantly decreased in Alzheimer's + curcumin, Alzheimer's +Niosome curcumin, curcumin and sham groups compared to Alzheimer's group. Niosome curcumin compared to sham, control, curcumin, Alzheimer's + curcumin and Alzheimer's + Niosome curcumin groups had a significant increase (p<0/0001,0/001, 0/01) and the Alzheimer's group did not have a significant difference compared to the Niosome curcumin group (p>0/05).

Conclusion : The analysis of behavioral data from NORT showed that during Alzheimer disease induction by aluminum chloride the d2 and memory parameters were decreased. Administration of Niosome Curcumin and Curcumin improved the memory by increasing the d2. Also, the analysis of molecular data showed that the level of TLR4 gene expression increased during induction of Alzheimer's disease with aluminum chloride, and treatment with curcumin decreased its expression in contrast to niosome curcumin.

Keywords : Alzheimer; neuroinflammation; Novel Object Recognition Test; antioxidant; Toll like reseptor-4; niosome

Count: 289
Abstract ID: 399
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Effect of Carvacrol and Thymol on Protein Kinase C (PKC)α Expression in Rat Hippocampus

Submission Author: Zahra Azizi

Zahra Azizi[1], Samira Choopani[2], Mona Salimi[3], Nasser Naghdi[4]

1. Pasteur Institute of Iran
2. Pasteur Institute of Iran
3. Pasteur Institute of Iran
4. Pasteur Institute of Iran

Background and Aim : Alzheimer's disease (AD), one of the most common causes of dementia, leads to progressive neurodegeneration that affects cognition. It has been demonstrated that PKCα signaling pathways have a close correlation in neuropathological injuries in AD and Aβ production, and related dementia in transgenic mouse AD model could be ameliorated by activating this isoform. Recent studies have examined the efficacy of many medicinal plants and their active constituents in alleviating AD symptoms or affecting disease processes in various AD cellular and animal models. Our previous research showed that thymol and carvacrol can improve cognitive abilities in AD rat models. However, the mechanism of their action is not yet fully understood. In this study, the protein expression levels of PKCα were examined in the hippocampal cells of the AD rat model.

Methods : Infusion of Aβ25-35 into the rats' hippocampus was performed. Seven days after surgery, spatial reference memory was evaluated using the Morris Water Maze Test (MWM). Groups (n=10) received 0.2 nM bryostatin, 0.5, 1, or 2 mg/kg thymol, carvacrol, or 2 mL/kg 0.1% v/v Tween 80 (vehicle). All drugs were injected intraperitoneally 30 min before the MWM test each day. One Aβ-received group was tested in MWM with no injection. To determine the mechanism of the thymol and carvacrol effect, the protein expression of PKCα was accessed with western blotting in the hippocampus. Equal amounts of protein from individual rat's hippocampus were heated to 95°C, separated in 8% SDS-poly acrylamide gels, and transferred to PVDF membranes. Then, the membrane was incubated with primary antibodies (rabbit polyclonal anti-PKCε (1:1000), rabbit polyclonal anti-PKCα (1:500), and b-actin (1:1000) overnight. Afterward, they were incubated with Horseradish Peroxidase (HRP)-conjugated goat anti-rabbit IgG. Next, the blots were developed by ECL advanced western blotting detection kit, as described. Chemiluminescence detection was linear at 30 to 60 s of the exposure for all antibodies. The

exposed films were scanned, and densitometric analysis was done with ImageJ software. The data were analyzed using ANOVA.

Results : The escape latency increased in A?-received rats compared to the control group, and thymol and carvacrol reversed this deficit. Furthermore, in A?, thymol, carvacrol, or bryostatin group, PKC? expression was significantly higher than in the A? group ($P < 0.01$). Therefore, thymol and carvacrol upregulated PKC? expression in the brain and can exert their neuroprotective effects by activating PKC.

Conclusion : In conclusion, our study demonstrates that thymol and carvacrol stimulated the PKC pathway in AD model rats. Considering the PKC activating capacity of thymol and carvacrol, these terpenoid compounds could be suggested as therapeutic agents for AD management. It warrants further study and holds promise for AD patients.

Keywords : Thymol; Carvacrol; PKCα, Alzheimer's disease.

Count: 290
Abstract ID: 481
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Melatonin attenuates astrocytic reactivity to S100B in the hippocampus and hypothalamus of rats fed a high-fat diet

Submission Author: DAVOUD DORRANIPOUR

DAVOUD DORRANIPOUR[1], DAVOOD DORRANIPOUR[2], Mohsen Basiri[3], Mehran Hosseini[4]

1. -
2. PhD candidate in Anatomical Sciences, Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran
3. Associate Professor in Anatomical Sciences, Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran
4. PhD candidate in Anatomical Sciences, Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Previous studies have shown that melatonin has beneficial effects in several neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease. The neurotrophic protein S100B is a small calcium-binding protein expressed primarily by astrocytes and has been associated with several pathologies. It has been shown that high-fat diet can have profound impacts on brain function and induces astrocytic reactivity. Hence, the present study was performed to elucidate the impact of melatonin on hippocampal and hypothalamic expressions of S100B in high-fat-diet-treated rats.

Methods : Male adult Wistar rats were treated for 8 weeks with either standard diet (control, n=8) or high fat diet (HFD, n=16). After obesity induction, HFD treated rats orally received normal saline (HFD, n=8) or melatonin (HFD+Mel, n=8) at the dose of 5mg/kg for 28 days. The expression of S100B was investigated in the rats' hippocampus and hypothalamus immunohistochemically.

Results : Compared to the control group, the immunoreactivity of S100B was increased in both hypothalamus ($p<0.001$) and hippocampus ($p<0.01$) of HFD-treated rats. Melatonin treatment attenuated the upregulated S100B expression in both hippocampus and hypothalamus of HFD-treated rats ($p<0.05$ all).

Conclusion : To the best of our knowledge, the results of the present study for the first time showed that melatonin through downregulation of astrocytic reactivity can reduce and attenuate the neurodegenerative disorders triggered by obesity in rats.

Keywords : S100B protein; High fat diet; Hippocampus; Hypothalamus

Count: 291
Abstract ID: 433
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigating the short-term effect of quercetin and quercetin liposome on motor balance and alteration of Grin 1 and Grin 2 genes expression in the cerebellum of schizophrenic rats

Submission Author: Parinaz Soleimani vand khorasan

Parinaz Soleimani vand khorasan[1], Homeira Hatami[2], Mehdi Banan Khojasteh[3], Beheshteh Babazadeh [4]

1. M.Sc. Student of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
2. Associate Professor of Animal Physiology, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
3. Associate Professor of Anatomical Sciences, Department of Animal Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
4. Ph.D. Student, Department of Zoology and Physiology, Faculty of Biology, Baku State University, Baku, Azerbaijan

Background and Aim : Schizophrenia is one of the mental diseases that causes positive and negative and cognitive symptoms. Schizophrenia is caused by disturbances in neurotransmitter systems, oxidative stress and imbalance between free radicals and antioxidant system. Exposure to ketamine causes neurotoxicity as well as the symptoms of schizophrenia induced by it. Quercetin is a natural flavonoid compound, it is also an antioxidant and anti-inflammatory and reduces the psychological symptoms caused by ketamine. The NMDA receptor is an ionotropic glutamate receptor that consists of Grin 1 and Grin 2 gene subunits. These genes play essential roles in brain functions and are involved in the pathogenesis of schizophrenia. So in this study, we evaluated the short-term effect of the antioxidant quercetin and quercetin liposome on motor balance along with the changes in Grin1 and Grin2 gene expression and in the cerebellum of rats following ketamine toxicity and treatment with quercetin and quercetin liposome.

Methods : Materials and methods: In this study, 56 male rats were randomly divided into 3 groups (n=8): 1) control (14 days of saline), 2) sham (14 days of 25% ethanol , 3) ketamin(Schizophrenia)(20mg/kg; 14 days), 4) ketamin + quercetin, 5) quercetin (30mg/kg; 14 days), 6) quercetin liposome (30mg/kg; 7 days), 7) ketamin + quercetin liposome. (Injection of drugs is intraperitoneal). Motor balance was evaluated by rotarod test on the 7th day of injection.

After completing the experiments, the cerebellum was separated from the brain of the animal in order to investigate and measure the expression of Grin1 and Grin2 genes using RT-PCR.

Results : Data analysis showed that ketamine + quercetin group, ketamine + quercetin liposome group and quercetin liposome group had a significant increase compared to the sham group ($p<0/01$, $p<0/05$, $p<0/05$); Also, the sham group had a significant decrease compared to the control group ($p<0/05$). And the quercetin liposome group and ketamine + quercetin liposome group had no significant difference compared to the control group ($p>0/05$). The sick rats fell faster on the rotarod, and the rats treated with quercetin and quercetin liposome fell less. The expression of the Grin2 gene in the sham group was significantly increased compared to the ketamine and quercetin + ketamine group and the level of Grin1 gene expression in the ketamine group was significantly decreased compared to the quercetin group and the ketamine group has a significant increase compared to the quercetin liposome group, but the quercetin + ketamine liposome group has no significant difference compared to the ketamine group.

Conclusion : The analysis of the behavioral data obtained from the rotarod test showed that schizophrenia causes deficit in movement balance in male rats, and quercetin and quercetin liposome improve this disorder. Analysis of molecular data showed that the expression level of Grin 1 and 2 genes increased during the induction of schizophrenia and treatment with quercetin and quercetin liposome decreased the expression of these genes.

Keywords : Schizophrenia; Rotarod test; Antioxidant; Liposome;Grin1 and Grin2 Gens

11th Basic and Clinical Neuroscience Congress 2022

February 13-14, 2023   **Tehran, Iran**

Count: 292
Abstract ID: 482
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

High-throughput bioinformatics investigation of differentially expressed RNAs in multiple sclerosis patients

Submission Author: Shaghayegh Mohammadi

Shaghayegh Mohammadi[1], Parand Heidarian Far[2]

1. Shahid Ashrafi Esfahani University
2. Shahid Ashrafi Esfahani University

Background and Aim : Multiple sclerosis (MS) also known as encephalomyelitis disseminate is a chronic inflammatory demyelinating disease of the brain. MS is the most common autoimmune disorder of the central nervous system. In 2020, the number of people with MS was 2.8 million globally, with rates varying widely in different regions. The cause of MS is unknown; however, it is believed to occur as a result of some combination of genetic and environmental factors such as infectious agents. Over the years, new molecular methods have been developed to detect neurodegenerative disease better and early. These molecular methods, such as DNA micro-array and PCR-based array, can show us molecular markers for early detection and prognosis of MS. Large-scale gene expression profiles provide important insights into the biology of MS. The results of these methods identified signaling pathways that could serve as therapeutic targets. In these decades, the competitive endogenous RNA (CeRNA) network can help us to detect valuable biomarkers and develop our knowledge about diagnosis MS and treatment process. In MS cells, the connection between the components of this network (levels of expression) changes (compared to the normal condition) and provides precious information about the disease and its progress

Methods : At the beginning GSE(GSE131281), gene expression profile, has been extracted from NCBI Gene Expression Omnibus (GEO). The extracted data was divided to two defended groups: MS and control. In GEO2R these datas were analyzed. 5 genes include: HLA_DRB5, PABPC1L2A, HLA_DRB1, ZNF75D, HCG4 Were extracted from downloaded excel full table based on upregulated genes (log FC +). In continue the Signaling pathway and gene ontology (biological process and cellular component) Of mentioned genes were checked in Enrichr data base. then by analyzing the interaction of multiple proteins in String data base we reached to the relation of the important protein network which are encoded by these genes in MS Cells.

Results : After careful analysis of GSE131281, 5 number of highest expressed genes were detected. DEGs with adjusted p-value < 0.05 and |logFC| > 0 were considered significant. 5 genes include: HLA_DRB5, PABPC1L2A, HLA_DRB1, ZNF75D, HCG4. Into the investigation of cellular mechanism of these genes, HLA-DRB5; HLA-DRB1 were involved in Immune System and Translocation Of ZAP-70 To Immunological Synapse pathways and PABPC1L2A gene was involved in RNA degradation process. As a result of this study, concluded that high expression of HLA_DRB5, PABPC1L2A, HLA_DRB1, ZNF75D and HCG4 can be effective in the development of MS Pathology symptoms and it's risk.

Conclusion : HLA-DRB1 is the transcript with highest expression in MS normal appearing grey matter (NAGM) Quantitative analysis confirmed the higher expression of HLA-DRB1 in cases at the protein level. Our data indicate that increased HLA-DRB1 expression in the brain of MS patients may be an important factor in how to increase MS risk in the target organ.

Keywords : MS, HLA-DRB1, Gene Ontology, Gene Expression profiling, Nerodegenerative disorder

Count: 293
Abstract ID: 294
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Effect of aerobic exercise in the prevention of people with dementia

Submission Author: Mahdi Nasiri

Mahdi Nasiri[1], Maryam Khoshnazar[2]

1. Student Research committee, School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Mazandaran, Iran
2. Student Research committee, School of medicine, Mazandaran University of Medical Sciences, Mazandaran, Iran

Background and Aim : A syndrome known as dementia is characterized by a decline in memory, thinking, behavior, and the capacity to carry out daily tasks. Dementia may eventually result in complete dependence and death. One of the most important global concerns facing health and social care in the 21st century is dementia. As of right now, dementia has no known treatment, and care for affected persons is expensive both financially and emotionally. Finding efficient methods to stop or delay its onset is therefore of the utmost significance. The link between physical activity and improved cognitive performance is becoming more and more clear.

Methods : The study of the resources, which included PubMed, Google Scholar, and Scopus, with the keywords of dementia, aerobic exercise, and prevention by eliminating the papers from 2011 to 2021; 12 articles were selected.

Results : According to meta-analyses of prospective studies, exercise during middle age is linked to a significantly lower risk of dementia. Exercise during middle age was also linked to a significantly lower risk of mild cognitive impairment in several studies. Randomized controlled trials (RCTs) found that people with dementia or mild cognitive impairment had higher cognitive scores after 6 to 12 months of exercise compared to sedentary controls. Aerobic exercise RCTs in healthy individuals were also linked to considerably higher cognitive scores, according to meta-analyses. In a sizable RCT of seniors, aerobic exercise for one year was linked to significantly greater hippocampus volumes and improved spatial memory. Another study looked into whether changing one's lifestyle could lessen or even reverse the age-related increase in blood pressure and decline in vascular function. Increased amounts of habitual exercise and greater cardiorespiratory fitness are linked to improved vascular health and cognitive function. As physical activity and cardiorespiratory fitness are linked to future cognitive function in middle age, exercise and cardiorespiratory fitness may be most crucial during this time. It is not fully known how much

exercise, particularly more specifically aerobic activity, affects the cerebral circulation. Less age-related gray and white matter loss as well as fewer neurotoxic factors are linked to physical activity, especially aerobic exercise. However, research on cognitive training indicates that exercising executive skills, such as working memory, enhances the effectiveness of the prefrontal network, supporting brain function in the face of cognitive decline. Cognitive activity improves the functioning and flexibility of neural circuits (software), whereas physical activity preserves the structural integrity of neurons and brain volume (hardware), boosting cognitive reserve in many ways.

Conclusion : According to research to date, exercise, particularly aerobic exercise, has a protective effect on cognitive function and memory in dementia patients.

Keywords : dementia, exercise, aerobic exercise, prevention

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

CRISPR systems; Promising therapeutic approaches for Alzheimer's disease

Submission Author: Amin Haratian

Hoorasa Hooshyari[1], Zahra Mohammadi[2], Amin Haratian[3]

1. Department of Animal Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran
2. Department of Animal Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran
3. Department of Cell and Molecular Biology, Faculty of Biological Sciences, Kharazmi University, Tehran

Background and Aim : Alzheimer's is one of the most common neurological disorders. Recent clinical trials' results show treating this disease requires innovative approaches. Considering that aging is the most significant risk factor for Alzheimer's, the accumulation of physical mutations in the brain and blood of Alzheimer's patients has also been investigated; For a long time, extracellular amyloid-beta protein aggregates and hyperphosphorylated microtubule-associated tau have been identified as neuropathological signs of Alzheimer's disease, but without success.

Methods : Genetic findings suggest that systemic failure of cell-mediated beta-amyloid clearance contributes to the onset and progression of Alzheimer's. Microglia are the innate immune cells of the brain and the leading players in Alzheimer's pathogenesis. Microglia subpopulations cluster around β-amyloid plaques and generate a specific transcriptome associated with neurodegeneration. The P522R variant of PLCG2 expressed by microglia is associated with a reduced risk of Alzheimer's disease. Evidence suggests that the PLCG2-P522R variant enhances the capacity of microglia to recruit T cells and present antigens; however, we lack a systematic understanding of the underlying mechanisms.

Results : The presented screening platforms systematically elucidate the functional consequences of genetic disorders in microglia derived from human pluripotent stem cells. CRISPER-Cas9-mediated gene editing now has the potential to identify new mechanistic insights into disease pathogenesis and mediate gene therapy. The CRISPR-CAS9 system has been accepted on human and mouse cell lines and animal models of neurodegenerative diseases. The ability to selectively and accurately edit the genome has led many to think that medicine is moving toward treating more genetic disorders. Moreover, CRISPR allowed researchers to do a genome-wide screening of the genes of iPSC-derived neurons. By doing so, many regulators of oxidative stress have been identified. Some genes such as GPX4 (encoding the selenoprotein glutathione peroxidase 4) and

PSTK, SEPHS2, and SEPSECS genes responsible for selenocysteine incorporation into proteins were identified as essential factors for the vitality of neurons.

Conclusion : The CRISPR system has provided us with endless opportunities and therapeutic approaches for treating Alzheimer's. Thereby, this system has the potential to enable us to uncover many genetic links between the causes of Alzheimer's disease.

Keywords : CRISPR; Gene-editing; Alzheimer's

Count: 295
Abstract ID: 227
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Increased microglial activity is responsible for behavioral changes during Alzheimer's disease model in rats

Submission Author: Sarieh Ghasempour

Sarieh Ghasempour[1], Nader Maghsoudi[2], Mola Mohammadi[3], Jalal Zaringhalam[4]

1. Physiology Department, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Neurobiology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Physiology Department, School of Medicine, Iranshahr Univercity of Medical Science, Iranshahr, Iran
4. Physiology Department, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background and Aim : Alzheimer's disease (AD) is one of the progressive neurodegenerative diseases. The etiology of AD is still unknown; however, various factors have been proposed in the pathophysiology of this disease in important areas of the central nervous system especially in the hippocampus. Microglia can play an active role in inducing and perpetuating inflammatory responses during AD. Therefore, activation of microglia following brain damage or neurodegenerative diseases such as AD, causes inflammation process.

Methods : In order to induce Alzheimer's model, STZ was injected intraventricularly at a dose of 3 mg/kg for two days on days 0 and 2. The Morris Water Maze behavioral test was performed 14 days after surgery and compared with the sham group. For molecular studies the hippocampus was extracted after the MWM test and then western blot test was done.

Results : In the MWM analysis, the escape latency and mean travel distance on the learning days in the STZ group significantly increased compared to the sham group. Also, on the probe day, the presence time STZ group in the target quadrant and the platform crossing frequency decreased compared to the sham group. Meanwhile the presence time in the opposite quadrant and latency to first increased compared to the sham group, which indicated a memory disorder in the rats receiving STZ in remembering the platform location. For molecular studies the expression level of Iba-1 was evaluated and it was seen that the expression level of Iba-1 in the STZ group was increased compared to the sham group, which confirmed the activation of microglia in the STZ group. By the injection of minocycline as an inhibitor of microglia in the behavioral results of

escape latency and mean travel distance on learning days and also all criteria were evaluated on the probe day were changed to the same extent as in the sham group.

Conclusion : Regarding the results obtained in this study, at least a part of behavioral changes during AD is mediated by hippocampus microglia activation and it seems those behavioral changes can be controlled by inhibition of those cells.

Keywords : Alzheimer disease; microglia; hippocampus; minocycline

Count: 296
Abstract ID: 42
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

neuroprotective effect of enoxaparin on the neurological scores,brain blood barrier & brain water content after severe traumatic brain injury in male rats:a behavioral,Biochemical & histological study

Submission Author: Mobasher Haji Abbasi

Mobasher Hajiabbasi[1], Vahid Alivirdiloo[2], Azizollah Sadeghi[3], *Ali Siahposht-Khachaki[4]

1. Medical Doctor, Islamic Azad University of Tonekabon, Tonekabon, Iran.
2. Medical doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
3. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
4. * Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran * Correspondence should be sent to: Ali Siahposht- Khachaki, PhD Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran * Correspondence should be sent to: Ali Siahposht- Khachaki, PhDImmunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran P.O.Box: 48471- 91971, sari, Iran; Tel & Fax: +98-11-33543081 Fax: +98-11-33543249Email: a.siahposht@mazums.ac.ir or ak57n@yahoo.com

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 (eg, 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 Marmarou diffuse brain injury, 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: 297
Abstract ID: 51
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Lamotrigine's neuroprotective effects on neurological scores,blood-brain barrier permeability,&brain edema after severe traumatic brain injury in male rat:A behavioral,biochemical&histological study

Submission Author: Taha Babaei

Taha Babaei[1], Seyedeh Mahla Hosseinzadeh[2], Amir Hesam Espahlar[3], Ali Siahposht-Khachaki[4]

1. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
2. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
3. Medical Doctor, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
4. Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Traumatic brain injury (TBI) is a very complex disorder that includes varying degrees of brain contusion, diffuse axonal damage, hemorrhage, and hypoxia. Lamotrigine (LTG) is an anticonvulsant drug that inhibits the release of glutamate from presynaptic neurons by blocking voltage-dependent sodium channels and has been shown to have neuroprotective effects on the central nervous system. Therefore, in this research project, we investigated the neuroprotective role of Lamotrigine in the process of diffuse trauma in rats, as well as its effect on interleukin levels and histological changes.

Methods : After induction of anesthesia and cannulation in the trachea, Wistar rats underwent diffuse controlled brain injury by the Marrow method, and 30 minutes later, the drug was injected intraperitoneally with different doses and repeated in the following days. . 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, Cerebrospinal fluid (CSF) was collected from Cisterna Magna and used for the enzyme-linked immunosorbent assay (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 hematoxylin 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 traumatic brain injury causes edema of the brain tissue, destruction of the blood-brain barrier, and changes in neurological scores and balance of the animal. It also increases interleukin 1 beta and decreases interleukin 10 in CSF fluid. Our findings also showed that Lamotrigine at doses of 10 mg/kg and 20 mg/kg could reduce these differences compared to the control group (p <0.001). It should be noted that lamotrigine was more effective at a dose of 20 mg/kg (P <0.0001).

Conclusion : Based on this study, it can be found that dose-dependent lamotrigine has neuroprotective effects in the brain and was able to affect the consequences of concussion and reduce cerebral edema, accelerate the improvement of blood-brain barrier status and neurological scores, and be balanced. Second, these effects of lamotrigine may be due to a decrease in inflammatory interleukins and an increase in anti-inflammatory interleukins.

Keywords : Lamotrigine, Neuroprotective, Brain trauma, Brain edema, Blood-brain barrier, Interleukins

Count: 298
Abstract ID: 54
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Rosiglitazones(PPAR-γ agonist)neuroprotective effects on neurologic rates,blood-brain barrier permeability&brain edema after shocking brain injury in male rat:a behavioral,biochemical&histologic study

Submission Author: Parham Asgarian

Parham Asgarian[1], Sara Yaghoobzadeh [2], Amir Hossein Mahdavi [3], Narges Karimi [4], Ali Siahposht-Khachaki[5]

1. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
2. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
3. Medical Doctor, Mazandaran University of Medical Sciences, Sari, Iran
4. Associate Professor of Neurology, School of Medicine, Immunogenetics Research Center, Clinical
5. Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

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. Rosiglitazone is a gamma receptor-activated proxyzome agonist (PPARgamma) known for its anti-inflammatory effects through PPAR- activation. Previous studies have shown that neuroprotective effects may have chronic brain damage in animal models such as Alzheimer's disease. Therefore, in this research project, we investigated the neuroprotective role of rosiglitazone in the process of diffuse traumatic brain injury in rats, as well as its effect on histological changes and neuronal inflammation.

Methods : After induction of anesthesia and cannulation in the trachea, 60 Wistar rats underwent diffuse trauma, and 30 minutes later, Rosiglitazone 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 hematoxylin 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 the blood-brain barrier, disturbance of neurological and balance-motor scores of the animal, and also causes perivascular edema, perineural edema, astrocytic

edema, and neurotic necrosis occurs (P <0.0001). Reduced inflammation (P <0.001). Our findings also showed that enoxaparin at doses of 4 mg/kg and 8 mg/kg could reduce these differences compared to controls (Sham and Intact) (p <0.001).It should be noted that Rosiglitazone was more effective at a dose of 8 mg/kg (P <0.0001).

Conclusion : Based on this study, it can be found that Rosiglitazone has neuroprotective effects on 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 : Rosiglitazone, Neuroprotective, Brain trauma, brain edema, interleukins

Count: 299
Abstract ID: 126
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Memantine alleviates brain injury and neurobehavioral deficits after experimental traumatic brain injury in rats

Submission Author: Somayeh Nazari

Somayeh Nazari[1], Rama Khanian[2], Ali Siahposht-Khachaki7[3]

1. 2Student Research Committee, school of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari Mazandaran, Iran
2. 1Pharmacy Docter ,Department of Physiology and Pharmacology, Ramsar Campus, Mazandaran University of Medical Sciences, Ramsar, Mazandaran, Iran
3. PhD, Assistant Professor, Immunogenetics Research Center, Department of Physiology, Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran

Background and Aim : Traumatic brain injury (TBI) is a major source of health loss worldwide. However, the therapeutic intervention is limited. In this research, we evaluated the neuroprotective effect of memantine on brain dysfunctions induced by diffused experimental TBI.

Methods : In this study, after induction of diffused experimental TBI, memantine was intraperitoneally injected to male Wistar rats at the doses of 10, 20, and 40 mg/kg. The veterinary coma scale (VCS) was used to evaluate short-term neurological deficits. Blood-brain barrier (BBB) disruption was assessed by the Evans Blue dye method, 6 hours after TBI induction. Vestibulomotor function was evaluated by beam-walk and beam-balance techniques. Histopathological changes of brain tissue in different groups were also appraised using light microscopy, haematoxylin, and eosin staining. Furthermore, brain water content and cerebrospinal fluid (CSF) content of matrix metalloproteinase 9 (MMP-9) were assessed by the wet/dry method and enzyme-linked immunosorbent assay (ELISA), respectively.

Results : Memantine at the doses of 20 and 40 mg/kg significantly reduced brain edema and BBB disruption (P<0.01), and recovered TBI-induced neurological deficits (P<0.001), 30 minutes after TBI. CSF MMP-9 was significantly reduced following memantine administration at the dose of 40 mg/kg (P<0.001). Furthermore, memantine at the doses of 20 and 40 mg/kg altered CSF concentration of Interleukin-1 beta (IL-1β) and Interleukin-10 (IL-10) in comparison with the sham group (P<0.01 and P<0.001, respectively).

Conclusion : Conclusion: In conclusion, we suggested that memantine may improve TBI-induced neurobehavioral deficits, providing a potential therapeutic choice in the treatment of TBI.

Keywords : Memantine; Neuroprotection; Blood-brain barrier; Traumatic brain injury (TBI)

Count: 300
Abstract ID: 31
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The effects of Atrial Natriuretic Peptide on the Blood-Brain Barrier permeability, neurological scores and brain edema after severe traumatic brain injury in male rat: the role of MMP-9

Submission Author: Vahid Alivirdiloo

Vahid Alivirdiloo [1], Mehrdad seyfi[2], Ali Siahposht-Khachaki[3], Davood farzin[4], Ali Rashid shabkahi[5]

1. Medical doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
2. Medical doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
3. *Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran * Correspondence should be sent to: Ali Siahposht- Khachaki, PhDImmunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Department of pharmacology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
5. Pharmacy doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran

Background and Aim : ANP The atrial natriuretic hormone, which is released from the heart into the bloodstream in response to increased circulating blood volume or hypoxic conditions, has dilating blood vessels, lowering blood pressure and natriuretic activity, and there are a wide range of receptors for this hormone in the brain. It appears to have neuroprotective properties, but its exact mechanism is not yet known. Therefore, in this study, we investigated the neuroprotective effects of atrial natriuretic peptide after animal model of traumatic brain injury (TBI).

Methods : thirty minutes after traumatic brain injury induction by Marmarou free fall method, the male Albino wistar rats received ANP three different doses (5, 10 and 20mg/kg) were administered intraperitoneally. VCS of animals were recorded prior (pre), after (D0), 24 hours later (D1), 48 hours (D2) and 72 hours (D3) after TBI induction. Vestibulomotor tests were evaluated by Beam Walk (BW) and Beam Balance (BB) tests in similar fashion. To determine permeability of Blood-Brain Barrier (BBB) 4-6 h and brain edema 72 hours after TBI induction, Evans-Blue dye and Wet-Dry methods were employed respectively. Cerebrospinal fluid (CSF) was collected 72 hours after TBI induction to evaluate the levels of a matrix metalloproteinase-9 (MMP-9).

Results : results have shown that inducing TBI can cause decline in VCS, cerebral edema, BBB dysfunction, vestibulomotor impairment, and alteration of cytokines in favor of inflammation in

CSF. Nevertheless, i.p, administration of ANP in 5 and 10 mg/kg can attenuate these finding (P<0.001). Also, ANP (5, 10 mg/kg) effectively decreased MMP-9 in CSF (P<0.001). All findings were more noticeable in 5mg/kg ANP dose.

Conclusion : Single dose of ANP (5, 10 mg/kg) can effectively decrease MMP-9 and attenuate the injury induced by trauma. Although, all effects were more pronounced with 5 mg/kg ANP.

Keywords : ANP, Traumatic brain injury, Neuroprotection, MMP-9, rat

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 301
Abstract ID: 32
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The effect of L-carnitine on the blood brain barrier, neurological score and brain edema after severe traumatic brain injury in male rat: a behavioral, biochemical and histological study

Submission Author: Vahid Alivirdiloo

Vahid Alivirdiloo [1], Babak Khorramian[2], *Ali Siahposht-Khachaki[3]

1. Medical doctor, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
2. Medical Student, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
3. *Immunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran * Correspondence should be sent to: Ali Siahposht- Khachaki, PhDImmunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran P.O.Box: 48471- 91971, sari, Iran; Tel & Fax: +98-11-33543081 Fax: +98-11-33543249Email: a.siahposht@mazums.ac.ir or ak57n@yahoo.com

Background and Aim : TBI (traumatic brain injury) is one of the most complicated diseases known to affect the body's most complex organ, the central nervous system. It is a worldwide health concern and the leading cause of death among young people in developed countries. Different degrees of brain contusion, diffuse axonal damage, bleeding, and hypoxia are all symptoms of traumatic brain injury, an extremely complicated disease (TBI). The amino acids lysine and methionine are combined to form carnitine, which causes fat cells to release energy. It was recently discovered that it has a significant influence on neurobiological activities in a variety of conditions such as brain hypoxia, ischemia, brain injury, and neurodegenerative diseases. In this study project, we investigated the protective role of L-carnitine (LC) in the process of diffuse concussion in rats, as well as its impact on the quantity of oxidant agents and histological changes.

Methods : After anesthesia was administered and the trachea was cannulated, Wistar rats were given a diffuse controlled concussion using the snake method. Thirty minutes later, they were given different doses of L-carnitine (25, 50, and 100 mg/kg) intraperitoneally, and behavioral tests were performed the next day. prior to the shock, immediately following regaining consciousness during shock induction, 24 hours later, 48 hours later, and 72 hours later The rats were subjected to coma scale, beam walk, and beam balancing tests, with the results recorded. After 72 hours, CSF from Cisterna Magna was collected, and the level of oxidants was determined using an ELISA assay. After the rats were murdered under anesthesia, their brains were removed, fixed in 10%

formalin for 48 hours, and stained with hematoxilin and eosin. The permeability of the blood-brain barrier was investigated by injecting Evans dye into rats from various groups after concussion induction.

Results : The findings of this study show that controlled diffuse trauma causes brain tissue edema, a breakdown of the blood-brain barrier, and changes in the animals' neurological and balance scores. Furthermore, it causes a decrease in antioxidants and an increase in oxidants in the CSF (P 0.001). When LC is administered at doses of 25 mg/kg and 50 mg/kg, these disparities can be reduced when compared to the control group (P 0.001). Neurons were healed, necrosis and perivascular edema were reduced, and other histological changes were made. It should be noted that 100 mg/kg L-carnitine had no effect (P>0.05).

Conclusion : According to this study, L-carnitine has dose-dependent neuroprotective effects in the brain and has been shown to reduce brain edema and speed up recovery from concussions. blood-brain barrier, neurological system, and balance scores Furthermore, these LC effects are most likely the result of a decrease in oxidants and an increase in antioxidants, which has been linked to improved histological findings.

Keywords : L-carnitine, neuroprotective, brain trauma, cerebral edema, antioxidants , Traumatic brain injury

Count: 302
Abstract ID: 417
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Pam3cys prevents overexpression of TNF-α and amplified expression of IL10 after Traumatic brain injury

Submission Author: Bahar Khoshkroodian

Bahar Khoshkroodian[1], Hanieh Javid[2], Hamid Gholami Pourbadie[3], Mohammad Sayyah[4]

1. Pasteur Institue of Iran
2. Pasteur Institue of Iran
3. Pasteur Institue of Iran
4. Pasteur Institue of Iran

Background and Aim : Traumatic brain injury (TBI) is an injury to the brain caused by an external force. The global incidence of all-cause, all-severity TBI is estimated to be about 1%, of which 0.74% is related to mild TBI and 0.073% belongs to severe TBI. The toll-like receptor 1/2 agonist tri-palmitoyl-S-glyceryl-cysteine (Pam3Cys) is safe, well-tolerated, and effective adjuvant in prophylactic human vaccines. We aimed to examine the post-TBI administration effect of Pam3Cys on TBI neuroinflammation.

Methods : Trauma was exerted to the temporoparietal cortex of rats by the Controlled Cortical Impact device. Then, rats received a single dose (0.01µg /rat) of Pam3cys through intracerebroventricular injection. The level of TNF-α and IL-10 was measured in rats' brains by western blotting at 6h, 24h, and 48h after TBI.

Results : TNF-? expression was significantly increased 6h after TBI compared to the Sham group ($p < 0.0001$). Administration of Pam3cys to traumatic rats inhibited overexpression of TNF-? 6h after trauma ($p < 0.01$). Administration of Pam3cys to traumatic rats significantly amplified overexpression of IL-10 48h ($p < 0.01$) but not 24h after TBI.

Conclusion : Administration of Pam3cys shortly after TBI reduces overexpression of TNF-α 6h and augments overexpression of IL10 48h in rats underwent traumatic brain injury.

Keywords : Traumatic barin injury, Pam3cys, neuroinflammation, Toll-Like rceptor, Controlled cortical impact

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 303
Abstract ID: 421
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The neuroprotective effects of Allicin on the neurological scores, blood brain barrier permeability and brain edema after severe traumatic brain injury in male rat: A behavioral, biochemical and histol

Submission Author: Aidin Sadeghy

Seyed Reza Seyedin[1], Aidin Sadeghy[2], Moslem Mohammadi [3], Ali Siahposht –Khachaki [4]

1. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
2. Medical student, Student Research Committee, Amol Campus of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Assistant Professor, imunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Allicin has a wide range of pharmacological functions, all of which can be demonstrated in anti-inflammatory, antioxidant, antifungal and anti-tumor activities. Therefore, in this research project, we investigated the neuroprotective role of allicin in the process of diffuse t in rats, traumatic brain injury as well as its effect on interleukin levels and histological changes.

Methods : 56 Wistar rats underwent diffuse controlled brain injury by Marmarou method, and 30 minutes later, the drug was injected intraperitoneally with different doses and repeated in the following days. . 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.

Results : Our findings also showed that allicin at doses of 25 mg / kg and 50 mg / kg can reduce these differences compared to the control group (Sham and Intact) (p <0.001). It should be noted that allicin was more effective at 25 mg / kg (P <0.0001).

Conclusion : in this study, it can be found that firstly, dose-dependent Allicin has neuroprotective effects in the brain and was able to affect the consequences of trauma and reduce cerebral edema, accelerate the improvement of blood-brain barrier and neurological scores and be vistibulomotor function. Second, Histological changes have also been shown to improve.

Keywords : Allicin, Neuroprotective, Brain trauma, Brain edema, Blood-brain barrier, Interleukins

Count: 304
Abstract ID: 239
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Ultrasound-guided versus blind subacromial bursa corticosteroid injection for paraplegic spinal cord injury patients with rotator cuff tendinopathy: a randomized, single-blind clinical trial

Submission Author: Najmeh Sadat Boland Nazar

Najmeh Sadat Boland Nazar[1], Ali Akbar Malekirad[2], Farhad Torfi[3]

1. Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Biology and Psychology, Payame Noor University, Tehran, Iran
3. Surgical Department,Taleghani Hospital,Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : The aim of this study is to estimate and compare the therapeutic effect of corticosteroid injection with and without sonography in paraplegic spinal cord injury patients with rotator cuff tendinopathy referring to physicians and rehabilitation clinics of Tehran University of Medical Sciences

Methods : This is a one-blind randomized; clinical trial study was performed on patients with paraplegic spinal cord injury below T6 level that referred to physical medicine clinics in 2018. Patients were randomly divided into two groups: in first group(A), in sterile conditions, received sub acromial corticosteroid injections by off- ultrasound probe(sham) and in second(B) group by using on-ultrasound probe both in lateral approach.All injection was performed by a physical and rehabilitation physician. Further, the criteria included VAS and Constant Score and the BREF QOL questionnaire were measured at time of entry into the study, follow up performed two weeks and two months later for each patient. In both groups, similar exercise was prescribed twice a day. Results were analyzed by SPSS18

Results : Demographic data including age A:28.1, B:33.8 , (P = 0.140), Duration of Shoulder pain (month),A:22,B:23, (P = 0.864) and SCI duration(year),A:9.4,B:8.8, (P =0 .717), frequency distribution complete/incomplete, education level, Marital Status,cause of injury ,Occupation, and self -related health did not have significant differences between two groups. The mean CONSTANT score in the two groups did not have significant difference before the intervention (p = 0.512) . This score in the second week and the second month after intervention had significantly differences (P = 0.001). This score in each group, in comparison from baseline to 2 mounts later had shown a significantly difference (more improve in the ultrasound group than blind group) (P

= 0001). The mean score of the BREF questionnaire after 2 month in ultrasound group had shown more improvement but not statistically significant.(P-value=0.2).Self-related health had similar finding. Mean score of VAS before the intervention does not have a significant difference (p = .0582). But, this score in the second week and the second month after the intervention was shown significantly improvement in ultrasound group(p= 0.001). Frequency distribution of Flexion, Abduction, Ext.Rot and Int.Rot is similar in the two groups before intervention with no significant difference. So, Flexion, Abduction, Ext.Rot and Int.Rot had a significant difference in the second week and second mount after intervention in ultrasound group(P<0.05).

Conclusion : Although, ultrasound guide injection is more expensive & less available than blind injection, ultrasound guided injection has more effectiveness in pain improvement, function and relatively in quality of life.

Keywords : therapeutic effect - corticosteroid with and without sonography - paraplegic spinal cord injury - rotator cuff tendinopathy

Count: 305
Abstract ID: 291
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

MAG, LRP1, and GAP43; potential candidates for regulating axon regeneration in spinal cord injury

Submission Author: Alireza Salimi

Alireza Salimi[1], Reza Salarinia*[2]

1. Department of Advanced Technologies, School of medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran.
2. Department of Advanced Technologies, School of medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran.*: Correspond author

Background and Aim : Axonal regeneration is a necessary step in the process of recovering from spinal cord injury (SCI). However, the axons in the adult central nervous system (CNS) cannot regenerate easily, which primarily causes the lack of adequate restorative therapy for SCI so far. Several attempts have been made to promote regeneration, and some advances have been obtained. Finding essential genes for targeting could be a great advanced strategy for axon regeneration.

Methods : After collecting genes associated with regeneration in a recent database, the DAVID database was used for choosing a gene list related to axon regeneration by entering the list into the string database protein interaction was obtained. Hob gene occurs by using Cytoscape according to a degree. Finally, the function of the protein was verified in the GeneMANIA database.

Results : Our results show that MAG (Degree:7), LRP1(Degree:5), and GAP43 (Degree:5)are important in the regulation of axon regeneration functions these proteins controlling axon regeneration include: axonogenesis, axon extension, regulation of cell growth, regeneration, regulation of nervous system development, regulation of neurogenesis, regulation of axonogenesis.

Conclusion : SCI is a devastating disease and often leads to severe disability. Unfortunately, there is still no clinical treatment presently. The regeneration capacity of nerve tissues after SCI is very limited. Finding critical genes which regulate axon regeneration could be a great strategy to overcome SCI.

Keywords : Regeneration; Spinal cord injury; development

Count: 306
Abstract ID: 229
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Inflammation and Traumatic spinal cord injury, the key role of neutrophils

Submission Author: Abolfazl BarzegarBafrouei

Abolfazl BarzegarBafrouei[1], Moosa Javdani[2]

1. Department of clinical sciences, Faculty of veterinary medicine, Theriogenology section, Shahid Chamran university, Ahvaz, Iran
2. Department of clinical sciences, Faculty of veterinary medicine, Surgery section, Shahrekord university, Shahrekord, Iran.

Background and Aim : Traumatic spinal cord injury (SCI) includes a series of events that increase the amount of tissue damage. Also, this injury causes a continuous and severe inflammatory response in the injured area. In the central nervous system (CNS), not controlling the intensity of the immune response encourages a negative effect that causes damage to the nervous tissue and poor recovery. Systemic inflammation of endogenous or exogenous origin may stimulate intraspinal inflammation. traumatic injury caused by spinal cord compression has two phases: primary and secondary injuries. Primary injury can result from physical compression of the spine, disruption of local blood supply, or stretching of nerve tissue. This injury causes narrowing of the spinal canal and spinal deformity. Secondary injury is a complex series of events that occurs after the initial injury and continues from minutes to weeks after the SCI. Several mechanisms are the basis of the pathogenesis of secondary injuries; including inflammation, gliosis and neurodegeneration.

Methods : The present study reviewed studies on Inflammation and Traumatic spinal cord injury, the key role of neutrophils. The review article is written according to the keywords "Traumatic spinal cord injury (SCI), Central nervous system (CNS), Inflammation response, Neutrophils".

Results : Many intraspinal events cause this secondary damage, but the activation of inflammatory cells through blood circulation (a type of systemic response) may cause tissue damage outside the CNS. Thus, these systemic responses may affect the progression of spinal cord injury or the recovery of spinal cord injury. The biochemical and cellular characteristics of secondary damage following the damaged spinal cord, like the characteristics of damage to other organs, are caused by the systemic inflammatory response following severe general trauma. In both cases, neutrophils play an essential role in the initiation and expansion of the inflammatory response. Key proteins

participate in the inflammatory cascade of damaged tissue. Neutrophils are the first inflammatory cells that arrive at the site of injury in non-neural and neural tissues. With their phagocytic property and other properties, they are able to remove tissue remains and restore vital balance (homeostasis). For example, the oxidative enzyme metalloperoxidase increases in the injured spinal cord. Matrix metalloproteinase 9 mediates damage to the injured spinal cord. Cyclooxygenase-2 (COX-2) causes secondary damage in the injured spinal cord and is also a major player in inflammatory conditions outside the central nervous system.

Conclusion : Neutrophils participate in phagocytosis and clearance of tissue debris. They release inflammatory cytokines, proteases and free radicals that destroy the extracellular matrix. They also activate astrocytes and microglia and cause neuroinflammation. neutrophils play an important role in the regulation of nerve inflammation in the initial stage of SCI, which shapes the stages of immunity and repair of the immune system in the later stages.

Keywords : Traumatic spinal cord injury (SCI), Central nervous system (CNS), Inflammation response, Neutrophils

Count: 307
Abstract ID: 328
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Combined use of platelet-rich plasma and adipose tissue-derived mesenchymal stem cells shows a synergistic effect in experimental spinal cord injury

Submission Author: Reza Salarinia

Reza Salarinia[1]

1. Department of Advanced Technologies, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Spinal cord injury (SCI) as a crippling disability causes tissue degeneration via neuron loss and fiber disruption. Some researchers have tried to reverse or minimize these changes. Platelet-rich plasma (PRP) is a biological product derived from peripheral blood containing a variety of growth factors. PRP has been extensively used in regenerative medicine. On the other hand, via secreting neuroprotective growth factors, mesenchymal stem cells (MSCs) have shown a promising potential in repairing central nervous system deficits. This study investigated the therapeutic effect of the combined use of MSCs and PRP in a rat model of SCI.

Methods : . We used real time-PCR method for evaluation of Bcl-2, Bax and caspase 3 expressions, TUNEL test for apoptotic cell death assessment, and neurofilament NF200 immunohistochemistry for examination of axonal regeneration. The results showed that co-treatment with MSCs and PRP efficiently alleviated the evaluated categories.

Results : Significant differences were observed in expression of Bcl-2 and caspase3, but not Bax, apoptotic index and the number of NF200 positive axons (for all $P \leq 0.01$) between co-treatment animals compared with those treated with only MSCs or PRP.

Conclusion : In conclusion, this study showed that combination of MSCs and PRP synergistically promotes their therapeutic effects in the SCI.

Keywords : Combined therapy; Mesenchymal stem cells; Platelet-rich plasma; Spinal cord injury.

Count: 308
Abstract ID: 343
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Secretome therapy as a novel acellular approach for curing spinal cord injury: focus on mechanisms and efficacy of secretome

Submission Author: Fatemeh Rahimzadeh

Fatemeh Rahimzadeh[1], Benjamin Babaei[2], Reza Salarinia[3]

1. Department of Advanced Technologies, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Department of Advanced Technologies, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
3. Department of Advanced Technologies, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Among traumatic lesions, Spinal Cord Injury (SCI) is one of the most common cause of disabilities that affect the functions of body limbs and the physical perception of the body. This issue remains a public health challenging worldwide which imposes a huge burden on individuals, families and societies.

Methods : In the last few years, stem cell therapies have been introduced as a promising approach in regenerative medicine. It is now well documented that regenerative features of these cells are related to bioactive molecules released by these cells which are termed "secretome". The secretome is composed of cytokines, chemokine's, growth factors, proteins, lipids, extracellular vesicles…which showed comparably high response rates, safety and delivery advantages compared to MSCs for spinal cord injury.

Results : Numerous studies have provided strong evidence in support of therapeutic effect of mesenchymal stem cell secretome in nerve regeneration and function recovery. In this review article we aim to describe the neuroprotective properties of secretome, we also discuss about comprehensive and comparative analyzes of beneficial effects of secretome in preclinical animal models and clinical cases of SCI.

Conclusion : finally mechanisms, strategies, preconditioning methods by exposing with some drugs for promoting the efficacy of secretome for SCI will be discussed.

Keywords : secretome; SCI; MSCs; nerve regeneration

Count: 309
Abstract ID: 365
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Biological activities of astaxanthin in neurodegenerative disease.

Submission Author: Alireza Lotfi

Mozaffar Khazaei[1], Alireza Lotfi [2], Zahra Abroodi[3]

1. Fertility and Infertility Research Center, Health Technology Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.
2. Department of Anatomical Sciences, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran.
3. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Neurodegeneration is the gradual and oncoming neuronal damage and dysfunction in the central nervous system. It is the first pathological trait of acute and chronic neurodegenerative situations such as neurotropic viral infections, stroke, paraneoplastic disorders, traumatic brain injury, multiple sclerosis (MS), Alzheimer's disease (AD) and Parkinson's disease (PD). These disorders are mostly the outcomes of the improper sedimentation and accumulation of proteins, such as amyloid-β, α-synuclein, and prions that can activate inflammasomes. The aging process leads to increasing the prevalence rate of neurodegenerative disorders. Despite the many efforts that have made there is no Definitive treatment for any of these diseases. Neurodegeneration is the major cause of cognitive and motor dysfunction. While AD and PD are more famous as neurodegenerative disorders, neurodegeneration is also evident in traumatic brain and spinal cord injury, stroke, multiple sclerosis and amyotrophic lateral sclerosis (ALS), neurotrophic infections, neoplastic disorders, prion diseases, as well as neuropsychiatric disorders and genetic disorders. Chronic activation of innate immune responses, which mediated by microglia, is the common characteristic of all of the mentioned disorders. Inflammatory reactions and apoptosis play a crucial role in the development of the neurodegenerative diseases. Reducing inflammation and apoptosis can be an effective strategy to treat these diseases. Astaxanthin is a natural antioxidant carotenoid that exists in a wide variety of living organisms Such as bacteria, yeast, fungi, and microalgae. It is a carotenoid with a formidable antioxidant and anti-inflammatory function. This review article focused on therapeutic characteristics of astaxanthin such as antioxidant, anti-inflammatory and anti-apoptotic effects on neurodegenerative diseases.

Methods : The information in this study was collected by searching Scopus, PubMed and Google Scholar databases. The studies that investigated the neuroprotective properties, which were conducted during the years 2000 to 2022, were selected.

Results : The results of this study show that astaxanthin has significant biological properties such as antioxidant, anti-inflammatory, and anti-apoptotic properties and can play an important role in the treatment of many neurodegenerative disorders.

Conclusion : According to the obtained information, the currently used drugs only suppress the symptoms of neurodegenerative diseases and have little effect on the treatment of epilepsy. The use of astaxanthin and similar natural compounds can be an effective solution in the treatment and prevention of neurodegenerative diseases with a few side effects.

Keywords : astaxanthin, neurodegenerative disorders, antioxidant

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
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Count: 310
Abstract ID: 330
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Exposure to mephedrone alters neurogenesis in embryonic neural stem/progenitor cells

Submission Author: Mohaddeseh sadat Alavi

Mohaddeseh Sadat Alavi[1], Hamid Reza Sadeghnia[2], Niloufar Nikpasand[3], Sajad Sahab Negah[4], Roghayeh Rashidi[5], Gholamreza Naseri[6], Ahmad Ghorbani[7]

1. Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran
2. Department of Pharmacology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
3. Department of Pharmacology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
4. department of Neuroscience, Mashhad University of Medical Sciences, Mashhad, Iran
5. Department of Pharmacology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
6. Gorgan Congenital Malformations Research Center, Golestan University of Medical Sciences, Gorgan, Iran
7. Department of Pharmacology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Mephedrone, a synthetic derivative of cathinone, is a commonly used psychoactive substance. Recent evidence suggested that mephedrone could affect brain function. The study aim is to investigate the effects of mephedrone exposure on the proliferation, differentiation, and apoptosis of rat embryonic neural stem/progenitor cells (NS/PC).
Methods : NS/PC was isolated from rat fetal ganglionic eminence region at embryonic day 14.5. The effects of mephedrone on cell proliferation, neurosphere formation (colonies of NS/PC), neuronal differentiation, and apoptosis of NS/PC were assessed using MTT, immunocytochemistry, and flow cytometry.
Results : Mephedrone at concentrations of (20-640 μM) significantly decreased the proliferation of NS/PC and induced cell cycle arrest. Neurosphere assays revealed a significant reduction in the number and diameter of neurosphere-forming cells. In addition, mephedrone significantly decreased expressions of DCX and NeuN neuronal markers.
Conclusion : Taken together, our results suggests that exposure to mephedrone has a neurotoxic impact on embryonic neurogenesis.
Keywords : Differentiation; Mephedrone; Neural stem cells; Neurotoxicity; Proliferation

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February 13-14, 2023
Tehran, Iran

Protective effect of Corylus avellana against glutamate-induced toxicity in PC12 and OLN-93

Submission Author: Sahar Fanoudi

Sahar Fanoudi[1], Hamid Reza Sadeghnia[2]

1. Department of Physiology and Pharmacology, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran
2. Department of Pharmacology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad

Background and Aim : Numerous studies have shown that uncontrolled release of glutamate, an important amino acid in the brain, play an important role in some neurodegenerative disease such as Alzheimer, ischemia and trauma. Different studies have shown that free radical production is considered to be involved in the glutamate-induced toxicity process. Anti-oxidant compounds from natural sources have attracted considerable attention in reducing of glutamate-induced toxicity. Iranian traditional medicine has recommended to consumption of nuts such as hazelnut (Corylus avellana) because it has a key role in memory and learning.

Methods : in this research neuroprotective effect of Hazelnut Polyphenol rich Extract (HPE) was investigated against glutamate. The cultured PC12 and OLN-93 cells were pretreated (2 hr) with varying concentrations of HPE (6.25-200μg/ml), followed by exposure to glutamate (8 mM) for 24 hr. The cell viability, ROS production, lipid peroxidation and DNA damage were investigated in both of cell lines.

Results : Results showed glutamate decreased cell viability significantly while HPE enhanced cell viability at dose of 100 μg/ml and 200 μg/ml in PC12 and at dose of 200 μg/ml in OLN-93. Also, glutamate increased ROS production and lipid peroxidation and HPE reduced them in both of cell lines. Also, comet assay showed glutamate increased DNA damage and HPE reduced it. In conclusion, the HPE decreased glutamate toxicity via reduction of stress oxidative parameters including decreasing of ROS production, lipid peroxidation and DNA damage.

Conclusion : Our data suggest that the protective effects of HPE against glutamate toxicity in PC12 and OLN-93 cells may be mediated through the amelioration of the oxidative stress and the resultant apoptosis.

Keywords : Corylus avellana; Hazelnut; glutamate-neurotoxicity; apoptosis; DNA damage; oxidative stress

Count: 312
Abstract ID: 426
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The effect of saffron on oxidative stress, TNF-α and Matrix metalloproteinase (MMP) in neurological disorders: A systematic review

Submission Author: Faezeh Moeini Badi

Faezeh Moeini Badi [1], Fatemeh Borazjani [2], S. Zahra Bathaie[3]

1. MSc .Student, Faculty of Para Medicene, Department of Nutrition, Ahvaz Jundishapur University of Medical Science, Ahvaz, Iran
2. Assistant Professor, Nutrition and Metabolic Diseases Research Center and Clinical Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. Professor of Biochemistry, Faculty of Medical Sciences, Department of Clinical Biochemistry, Tarbiat Modares University, Tehran, Iran.

Background and Aim : Neurologic disorders encompass diseases of the brain, spine, and nervous system and are the leading cause of disability on a global scale. Oxidative stress, by altering the structure and function of various proteins, including antibodies, causes a hyperactive immune response that may lead to an autoimmune disease in the central nervous system. An overactive immune system activates myelin-specific T cells, followed by microglia causing brain injury. Saffron is one of the natural remedies in traditional medicine being used that effectively decreases the levels of the oxidation products like lipid peroxidation (e.g., malondialdehyde, MDA) and increases the activity of antioxidant enzymes such as glutathione peroxidase (GPx) and superoxide dismutase (SOD) in the brain tissue. Saffron also exhibits anti-inflammatory, and anti-Aβ aggregation properties.

Methods : A literature survey in main databases such as PubMed, Web of Science, and Google Scholar was carried out until November 2022. "Saffron" OR "Crocus sativus" OR "Crocin" OR "crocetin" in combination with "neurologic disease" OR "Central nervous system" OR "Neurodegenerative Diseases" AND "tumor necrosis factor alpha (TNF-α)" OR "Matrix metalloproteinase (MMP)" OR "Oxidative Stresses" and all its components were used to construct the search strategy for finding the articles.

Results : There were 81 studies on saffron and neurologic disorders were identified. Thirteen related publications qualified for systematic review. Finally, after applying the inclusion and exclusion criteria, five randomized clinical trials were found, and the following results were

obtained in adults over 18 years old who have been supplemented by saffron and its constituents in neurological disorders. The influence of saffron on oxidative stress, TNF-? and Matrix metalloproteinase (MMP) was investigated, showing a significant improvement in levels of SOD, GPx, catalase (CAT), MDA, TNF?, and MMP-9. One study showed that crocin (the main constituent of saffron) increased total antioxidant capacity (TAC) (p=0.04), decreased MDA (p=0.01) and TNF?? (p=0.00) levels in multiple sclerosis (MS) at 4 weeks after treatment. Another study showed that although saffron did not alter the TNF?? (p=0.202) level, remarkably decreased MDA (p = 0.005), and increased GPx (p = 0.000), SOD (p = 0.015), and TAC (p = 0.022) levels in Alzheimer's disease after 12 weeks. It was also reported that daily consumption of saffron resulted in an observable effect on the decreased level of MMP-9 in patients with MS (p=0.006). Given that MMP-9 facilitates the migration of T-cells to CNS, the reduction of MMP-9 level could decrease the severity of disease in these patients.

Conclusion : According to the results of this review, saffron administration has improved inflammatory profile, antioxidant defense system and oxidative stress markers in neurologic disorders. The mentioned effects are because of free radical scavenging and antioxidant properties of saffron constituents. Thus, saffron can be a promising therapeutic agent to prevent progressive lesions in neurological disorders.

Keywords : Saffron; neurological disorder; TNF-α; oxidative stress; MMP

Count: 313
Abstract ID: 371
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Oxidative stress in the cerebellum of ovariectomized diabetic rats

Submission Author: Moslem Mohammdi

Moslem Mohammdi[1], Zohreh Zare[2], Sakineh Shafia[3]

1. Department of Physiology, Mazandaran University of Medical Sciences, Sari, Iran.
2. Department of Anatomical Sciences, Mazandaran University of Medical Sciences, Sari, Iran.
3. Department of Physiology, Mazandaran University of Medical Sciences, Sari, Iran.

Background and Aim : Oxidative stress might play an important role in neuronal damage caused by diabetes mellitus and ovarian hormone deficiency. To determine the combined effects of estrogen deprivation and diabetes mellitus on oxidative stress, we examined oxidative stress biomarkers, including glutathione (GSH), malondialdehyde (MDA) and reactive oxygen species (ROS) levels in ovariectomized diabetic rat cerebellum.

Methods : Fourteen days after bilateral ovariectomy, a single dosage of streptozotocin (STZ, 60 mg/kg) was intraperitoneally injected to adult female Wistar rats. Animal in the control group underwent sham operation and received an equal volume of citrate buffer as a vehicle (n = 5 rats/group). Fourteen days after induction of diabetes, animals were decapitated, brains were quickly removed, and cerebellums were then isolated for measuring oxidative stress biomarkers.

Results : Increased levels of both ROS and MDA were observed in the cerebellum of ovariectomized diabetic rats compared to the control group. There was no significant changes in the GSH level between control and ovariectomized diabetic rats.

Conclusion : According to our results, significant increase in the ROS and MDA levels indicates induction of oxidative stress in the ovariectomized diabetic rat cerebellum.

Keywords : estrogen; diabetes mellitus; glutathione; malondialdehyde; cerebellum

11ᵗʰ Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Count: 314
Abstract ID: 241
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Effects of chlorpyrifos on the caspase 3 levels and memory in male rats

Submission Author: Nasrin Hosseini

Nasrin Hosseini[1], Mona Farhadi[2], Seyed Behnamodin Jameie[3]

1. Neuroscience Research Center, Iran University of Medical sciences, Tehran, Iran
2. Department of Microbiology, Karaj Branch, Islamic Azad University, Karaj, Iran
3. Neuroscience Research Center, Iran University of Medical sciences, Tehran, Iran

Background and Aim : Organophosphate pesticide most widely is used in the world. Chronic exposure with chlorpyrifos may lead to some problems in cognitive functions such as learning and memory. Caspase-3 is a cysteine protease that actives in response to a number of apoptotic stimuli and triggers some proteolytic events, cell death, and neurodegeneration. In the present study we tried to clear potential mechanisms related to Chlorpyrifos neurotoxicity through caspase 3 alteration and memory function.

Methods : Male wistar rats were randomly divided into control, sham and Chlorpyrifos groups. Chlorpyrifos was dissolved in dimethyl sulfoxide and was injected 3 mg/kg/ intraperitoneal for 5 days for two consecutive weeks. The memory function was evaluated by passive avoidance task, and hippocampal caspase3 levels were assessed by western blot technique

Results : Our findings showed chlorpyrifos significantly increased hippocampal caspase 3 levels, and also increased dark stay times in 24h and 1week after receiving foot shock in chlorpyrifos group.

Conclusion : Chlorpyrifos exposure can impair memory function, and high levels of caspase 3 in the hippocampus results in neuronal toxicity and memory impairment.

Keywords : Organophosphates, Caspase 3, passive avoidance, Memory

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023　　　　Tehran, Iran

Count: 315
Abstract ID: 252
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

study of melatonin effects on neurobehavioral deficits induced by combined exposure of prenatal ethanol and postnatal stress in rats

Submission Author: Farzaneh Bagheri

Farzaneh Bagheri[1]

1. School of Biology, Damghan University, Damghan, Iran

Background and Aim : early-stressful situations and binge drinking are two burdensome conditions that can potentially contribute the brain development to negative outcomes in a synergistic way. The hippocampus, which has the largest number of glucocorticoid receptors in the brain, regulates the negative responses to stress. Prolonged glucocorticoide (GC) exposure induced by chronic stress and alcohol consumption cause oxidative stress, resulting in cognitive and emotional dysfunction. In this study we used melatonin, a powerful antioxidant and hypothalamus-pituitary adrenal (HPA) axis regulator, to ameliorate cognitive impairment induced by stress and ethanol co-exposure.

Methods : wistar rat dam were exposed to ethanol (4 g/kg) and melatonin (10mgkg) from gestational day (GD) 6 – to postnatal day (PND) 14 and LNS from PND0-PND14 individually or in combination. Pregnant rats divided to 8 groups: control, ethanol, ethanol + melatonin, ethanol + LNS, ethanol + LNS +Melatonin, LNS, LNS + melatonin, melatonin. Maternal behavior was observed in mothers. In the offspring corticosterone level, marker of oxidative stress, expression of CRHR1 and glucocorticoid receptors (GR, MR) and behavioral tasks including elevated plus maze test, morris water maze, novel object recognition, and object location memory tests was assessed.

Results : quantity and quality of maternal care significantly decreased in stress and ethanol co-exposed mothers. Melatonin treatment improved dam's nursing behavior. In the offspring plasma corticosterone was decreased in the Ethanol + LNS group and risk-taking behavior was increased significantly. Evaluation of gene expression such as GR, CRHR1 and BDNF indicated a reduction of GR and CRHR1 in ethanol group but not in LNS group compared to control. Co-exposure of ethanol and stress showed a significant decrease in the expression of GR and CRHR1 compared to stress alone. While BDNF mRNA level increased in ethanol group compared to control and also in Ethanol + LNS group compared to LNS alone. In the presence of stress and alcohol, the activity

of SOD and GPx decreased. MDA levels increased in the hippocampus of ethanol and LNS co-exposed animals when compared to the control group. Melatonin treatment significantly prevented oxidative damages, enhanced CRHR1 and GR expression level, decreased BDNF expression to a similar level of control group. Animals in Ethanol + LNS + Melatonin group showed an ameliorated performance at behavioral tasks.

Conclusion : We conclude that co-exposure to stress and ethanol impairs stress response and memory function, whereas melatonin can prevent these by inhibiting oxidative stress.

Keywords : ethanol, early-life stress, learning and memory, risk-taking behavior, oxidative stress, melatonin, rat

Count: 316
Abstract ID: 455
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Effects of modified Au@Ag core-shell Nanostructure on brain tissue in mice: crosstalk between apoptosis and autophagy

Submission Author: Mahsa Nazari

Mahsa Nazari[1], Ronak Shabani[2], Sahar Eghbali[3], Sahar Hakimpour[4], Maryam Akhavan[5], Marziyeh Ajdari[6], Azam Govahi[7], Mehdi Mehdizadeh[8]

1. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Reproductive Sciences and Technology Research Center, Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran
3. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
4. Department of Physiology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran
5. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
6. Endometriosis Research Center, Iran University of Medical Sciences (IUMS), Tehran, Iran
7. Endometriosis Research Center, Iran University of Medical Sciences (IUMS), Tehran, Iran
8. Reproductive Sciences and Technology Research Center, Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Silver is the most common noble metal used in the synthesis of nanoscale materials, particularly in room sprays, cosmetics, toys, clinical catheters, and wound dressings. In particular, studies have shown that silver nanoparticles can cross the blood-brain barrier (BBB), accumulate in the central nervous system, and cause neurotoxicity by damaging neurons, glial and endothelial cells. Many of these effects depend on the dose and administration of the nanoparticles. Because of the aforementioned effects of Ag- NP and their ability to cross the BBB, it is important to evaluate the effects of these particles, especially in individuals exposed to Ag- NP. In the present study, the toxicity of silver nanorod was investigated by deformation and with a biocompatible coating (alginate).

Methods : After synthesize of Au@Ag core-shell nanorod with alginate coating, nanostructure (NS) were characterized by HR-TEM, FT-IR, UV-visible, XRD and ICP-MS. The animals were divided into five groups (n=8), including one control group, two sham groups (received 1.5 mg/kg/day alginate solution for 14 and 35 days), and two treatment groups (received Ag-NS at the same dose and time). Finally, tissue from the forebrain region of each mouse was harvested and

used for TUNEL assay and gene expression for apoptotic and autophagic markers. Perikaryon morphology was examined with cresyl violet staining.

Results : According to high magnification images TEM, the Ag NS was rod-shaped and the average size of the particles was 60nm. The UV-visible confirms the formation of the synthesized nanosilver (rod shape). The change of nanostructure coating from CTAB to alginate was investigated by FTIR analysis, and XRD proved the presence of silver in the composition. Assessment of DNA fragmentation by the TUNEL assay showed that the nanosilver groups had significantly higher DNA fragmentation and the real-time PCR results also confirmed this. Expression of autophagic and apoptotic markers indicates activation of the apoptosis pathway compared to the autophagy pathway. The expression of LC3 and Beclin-1 (markers that initiate and continue the autophagy) was reduced compared to the sham and control groups. Also, examination of apoptotic pathway genes showed a decrease in Bcl-2 expression and an increase in Bax and caspase-3 expression. Tissue staining results show an increase in degenerate cells (known as dark cells) in forebrain cortex compared to nondegenerate cells (known as light cells).

Conclusion : This study investigated the acute (14 days) and chronic (35 days) effects of silver nanorod on brain tissue toxicity, which show a significant increase in apoptotic markers. This increase was observed mainly in the chronic phase, Therefore, due to the widespread use of nano-silver in everyday life and medicine, further investigations on the different forms of this structure and the reduction of its toxicity are of particular importance.

Keywords : Nanostructures; Apoptosis; Autophagy; Brain tissue

Count: 317
Abstract ID: 461
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Aerobic Exercise Training Enhances Skeletal Muscle Expression of PGC-1α and KAT in Rat Model of Olfactory Bulb Dysfunction Induced by Methimazole

Submission Author: Sahand Zare sharifi

Sahand Zare sharifi[1], Reza Gharakhanlou[2], Atefeh Rayatpour[3], Mohammad Javan[4]

1. Department of Exercise Physiology & Sport Sciences, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran
2. Department of Exercise Physiology & Sport Sciences, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran
3. Department of physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Department of physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Skeletal muscles modulates kynurenine (KYN) metabolism through alteration in Peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1α) and kynurenine aminotransferase (KAT) expression. Moreover, several reports indicated that the metabolism of KYN increases in different animal models of olfactory bulb (OB) impairment, which finally leads to an imbalance in KYN level in the brain and subsequently exacerbates neuroinflammation. Since the crucial role of skeletal muscle in modulating KYN metabolism has been well established, we hypothesized that aerobic exercise could compensate for the negative effects of increased KYN metabolism in methimazole induced olfactory bulb impairment model.

Methods : Twenty-eight male Wistar rats were divided into four experimental groups: Intact, exercise, methimazole, and methimazole-exercise. OB disturbance was induced by weekly intraperitoneal injection of 300 mg/kg of methimazole. Control groups received the same volume of saline. Exercise groups were under seven weeks of aerobic exercise. Finally, the soleus muscle sample was harvested to evaluate PGC-1α and KAT-I mRNA expression.

Results : Our results showed a significant reduction in PGC-1α expression in the methimazole-treated rats compared to the intact group; however, this effect was reversed after exercise in the methimazole-exercise group ($p<0.05$). Furthermore, our findings showed that exercise alone led to a moderate but non-significant increase in the PGC-1α expression. Additionally, the expression of KAT-I showed a moderate reduction in the methimazole group compared to the intact, whereas

its expression was significantly elevated in OB-disrupted rats that were under exercise ($p<0.05$). Furthermore, there was a non-significant increase in KAT-I expression after induction of exercise compared to intact.

Conclusion : Collectively, our results showed that exercise might overcome the negative effect of olfactory bulb impairment through the elevation of PGC-1α and KAT gene expression in skeletal muscle. Thus, exercise seems to be a promising approach for decreasing OB impairment complications; however, the contribution of other mediators in the KYN pathway remains to be elucidated.

Keywords : Aerobic Exercise Training; PGC-1α; KAT-I; Olfactory bulb dysfunction

Count: 318
Abstract ID: 460
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Neurological adverse effects of chimeric antigen receptor T-cell therapy

Submission Author: Mohamad Hosein Mohamadi

Mohamad Hosein Mohamadi[1], Kiarash Saleki[2], Parsa Alijanizadeh[3], Nima Rezaei[4]

1. Student Research Committee, Sabzevar University of Medical Sciences, Sabzevar, Iran
2. 1- Student Research Committee, Babol University of Medical Sciences, Babol, Iran. 2- USERN Office, Babol University of Medical Sciences, Babol, Iran. 3- Department of e-Learning, Virtual School of Medical Education and Management, Shahid Beheshti University of Medical Sciences(SBMU), Tehran, Iran
3. Student Research Committee, Babol University of Medical Sciences, Babol, Iran. USERN Office, Babol University of Medical Sciences, Babol, Iran.
4. 1- Corresponding author: Research Center for Immunodeficiencies, Children's Medical Center, Tehran. 2- University of Medical Sciences, Tehran, Iran. 3- Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. 4- Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Background and Aim : The use of cell-based treatments is increasing quickly as a next-generation therapy for cancer, beyond radiation therapy and chemotherapy. Chimeric antigen receptor (CAR) T-cell is among the most promising strategy that act by directing T-cells toward cancers; However, they need to be improved to reduce side effects and maximize efficacy (especially for solid tumors) prior to being used as standard therapy for malignancies.

Methods : First we searched for recent CAR T-cell therapy studies. We examined clinical studies regarding the adverse events and other undesired reaction after CAR T-cell therapy. We also, classified the nervous system related adverse events.

Results : Numerous studies reported neurotoxicity after CAR T-cell therapy. Regarding side effects of CAR T-cell thearpy, two syndromes exist. Immune effector cell-associated neurotoxicity syndrome (ICANS), previously called cytokine release encephalopathy syndrome (CRES), is a neuropsychiatric condition which can occur after treatment by immune effector cell (IEC) and T-lymphocytes utilizing treatments. Also, another syndrome is cytokine release syndrome (CRS) which may overlap with ICANS. ICANS clinical manifestations include cerebral edema, mild lethargy, aphasia, seizures, and stroke. Also, ICANS is associated with changes to EEG and neuroradiological findings. Hence, we should make a plan for early and precise diagnosis of

neurological complications of CAR T-cells by clinical presentations, neuroimaging, and EEG. As neurological complications by various CAR T-cell products are disparate, guides need to be developed according to each product.

Conclusion : In current study, we review recent findings of CAR T-cell treatment and applications, neurological events associated with their use, and risk factors contributing to ICANS. Also, we provide insights for future research.

Keywords : CAR T-cell therapy, neurological complications, ICANS, CRS

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 319
Abstract ID: 14
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The impact of sesamol and exercise on striatal TNF-α level, motor behavior, aversive memory and oxidative stress status in 6-hydroxydopamine-lesioned rats

Submission Author: Somayeh Shahidani

Somayeh Shahidani[1], Ziba Rajaei[2], Hojjatallah Alaei[3], Samaneh Mohammadzadeh[4]

1. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.
2. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.
3. Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.
4. Poursina Hakim Digestive Diseases Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Neuroinflammation and oxidative stress play critical roles in the pathophysiology of Parkinson's disease (PD), and neuroprotective agents could be helpful to slow down the dopaminergic neurodegeneration. Neuroprotective and antioxidant properties of exercise and sesamol have been previously reported. The current research evaluated the influences of sesamol and exercise on memory and motor impairments, oxidative stress and inflammatory markers in an experimental model of PD.

Methods : 6-hydroxydopamine (6-OHDA) was microinjected into the medial forebrain bundle of male rats. Treatment with sesamol (50mg/kg) or treadmill exercise was performed for 7 weeks. Behavioral and biochemical assessments were performed at the end of 6th week after 6-OHDA injection.

Results : Net number of rotations and tumor necrosis factor (TNF)-? level was significantly enhanced in 6-OHDA group in comparison with sham group. Also, step-through latency was decreased in this group along with increased lipid peroxidation and decreased total thiol levels in the hippocampus. Moreover, sesamol and exercise, alone or in combination, improved rotational behavior, which was accompanied by decreased striatal TNF-? level. However, sesamol and/or treadmill exercise had no effect on aversive memory, although exercise enhanced hippocampal total thiol level.

Conclusion : Beneficial properties of sesamol and treadmill exercise for amelioration of motor impairments might be due to their anti-inflammatory activities.

Keywords : Sesamol 6-OHDA Exercise Motor activity Memory Oxidative stress

Count: 320
Abstract ID: 33
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Solid lipid nanoparticles containing crocin increased the neuroprotective role against oxidative damage by activation sirt1/AMPK pathway

Submission Author: Seyran Kakebaraei

Seyran Kakebaraei[1], Cyrus Jalili[2]

1. Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran.
2. Department of Anatomy, School of Medicine, Kermanshah Medical University, Kermanshah, Iran

Background and Aim : Neurodegeneration is the conclusion of detrimental incidents affecting the nervous system that lead to neuronal cell apoptosis, especially in the neurons of the hippocampus and cortex zones. Oxidative damage is able of induced neurodegeneration. Crocin, a hydrophilic carotenoid from saffron, has potent antioxidant, anti-inflammatory, and neuroprotective properties which may have remedial worthiness for the control of neurodegenerative disorders example Alzheimer's disease. Crocin is encapsulated in solid lipid nanoparticles (SLNs) for further neuroprotection efficacy. In vitro study, H_2O_2-induced oxidative injured neurons and an induced seizure model were used to prospect the possible increased efficiency of neuroprotective action of Crocin- SLNs.

Methods : Embryonic mice (E14-E15) were selected to separate neurons. Fetuses were fragmented from anesthetized gravid mice, meninges were eliminated from brains with a stereoscopic microscope. Cortexes were incubated with trypsin solution, The centrifuged and resuspended cortical neurons were seeded on 6-well plates. Neuron cells incubated at 37°C, 5% CO_2, DMEM medium containing 2% B-27. Neurons were pre-treated with various doses of crocin or Crocin-SLNs (1,10, 25,50, and 100 µg/ml) plus H_2O_2 was added to the co-incubate. LDH and MDA level was measured, and Total RNA extraction, retrotranscription, and quantitative real-time PCR were performed. The difference between the treatments was considered statistically significant at $P<0.05$.

Results : Twenty-four hours of treatment with Crocin/SLN at higher concentrations (above 25 µg/ml)combined with the neurotoxic agent, H_2O_2, reduced cell death. Crocin/SLN significantly reduced oxidative damage in both LDH and MDA factors in neurons affected by oxidative stress. We illustrated that the protection of neuronal cells against H_2O_2 via crocin/SLN is mediated by the upregulation of the Sirt1/AMPK signaling pathway.

Conclusion : In this study, Crocin/SLN showed a protective and medicate effect through reducing oxidative damage, increasing antioxidant potency, and overexpression of the sirt1/AMPK pathway against the destructive changes of h2o2. Furthermore, the neuroprotective properties of Crocin/SLN become clear to be limited to specific models of neurotoxicity and depend on its concentrations and term of administration.

Keywords : Oxidative damage, Crocin/SLN, primary neuronal cell cultures, Sirt1

Count: 321
Abstract ID: 1
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Zerumbone Promotes Cytotoxicity in Human Malignant Glioblastoma Cells through Reactive Oxygen Species (ROS) Generation

Submission Author: Mohammad Montazami sadeghi

Mohammad Montazami sadeghi[1], Hamid Mollazadeh[2], Amir R. Afshari[3]

1. Student Research Committee, Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Department of Physiology and Pharmacology, Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
3. Department of Physiology and Pharmacology, Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Glioblastoma multiforme (GBM) is the most hostile tumor in the central nervous system. Unfortunately, the prognosis of GBM patients is poor following surgical interventions, chemotherapy, and radiotherapy. Consequently, more efficient and effective treatment options for the treatment of GBM need to be explored. Zerumbone, as a sesquiterpene derived from Zingiber zerumbet Smith, has substantial cytotoxic and antiproliferative activities in some types of cancer.

Methods : In detail, the apoptotic process triggered by Zerumbone involved the upregulation of proapoptotic Bax and the suppression of antiapoptotic Bcl-2 genes expression as determined by qRT-PCR. Moreover, Zerumbone enhanced the generation of reactive oxygen species (ROS), and N-acetyl cysteine (NAC), as an antioxidant, reversed the ROS-induced cytotoxicity of U-87 MG cells. The Western blot analysis suggested that Zerumbone activated the NF-κB p65, which was partly inhibited by NAC treatment.

Results : Here, we show that exposure of GBM cells (U-87 MG) to Zerumbone demonstrated significant growth inhibition in a concentration-dependent manner. Zerumbone also induced apoptosis and caused cell cycle arrest of human GBM U-87 MG cells in the G2/M phase of the cell cycle.

Conclusion : our results confirmed that Zerumbone induces cytotoxicity by ROS generation. Thus, the study raises the possibility of Zerumbone as a potential natural agent for treating GBM due to its ability to induce cytotoxicity.

Keywords : Zerumbone; Malignant Glioblastoma Cells; Cytotoxicity

Count: 322
Abstract ID: 58
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Investigating cognitive activity and hippocampal tissue changes in subchronic high-dose lead poisoning

Submission Author: Fatemeh Zare mehrjerdi

Fatemeh Zare mehrjerdi[1]

1. Department of Physiology, School of Medicine, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd. Iran

Background and Aim : Lead is one of the heavy metals that is abundant in our environment. Humans are exposed to lead in different ways and lead poisoning is one of the common poisonings that is less noticed in clinical departments. Lead affects all parts of the human body. The nervous system is one of the important target organs of this damaging metal. Lead accumulates in the body, so even small amounts are very harmful in the long term. In this study, the effect of high dose of lead on cognitive activity and hippocampal tissue changes was investigated in animals that received lead for one month.

Methods : In this study, 20 male Wistar rats were used. Animals were placed in two lead and control groups. Lead was added to drinking water for one month at a level of 500 ppm. In the last week of the experiment, the spatial learning and memory was evaluated using the Morris water maze. In the first 4 days of this test, the time and distance to reach the platform and in the last day, the time and distance to stay in the target quadrant was checked. Finally, after deep anesthesia, the brain of the animals was removed to assessment histopathological changes.

Results : The results of the spatial learning of the animals in the first 4 days of the test showed that the time and distance to reach the platform in the lead group increased ($p?0.01$, $p?0.001$). Also in the spatial memory of the animals on the last day of the test, the duration and distance of staying in the target quadrant decreased in the lead group comparison to the control group ($p?0.01$, $p?0.05$). In histological examination, the number of healthy cells in the hippocampus of rats poisoned with lead shows a significant decrease compared to the sham group ($p?0.05$).

Conclusion : In general, the results of this study indicate that exposing animals to a high dose of lead for one month can lead to hippocampal tissue damage. The hippocampus plays an important role in cognitive functions, especially learning and memory, so impairment in learning and memory is a consequence of damage to the hippocampus tissue.

Keywords : lead acetate, hippocampus, learning and memory, nissl staining

Count: 323
Abstract ID: 61
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Antidepressant-like effects of edaravone and minocycline: investigation of oxidative stress, neuroinflammation, apoptosis and neurotrophic pathways

Submission Author: Farzaneh Motafeghi

Farzaneh Motafeghi[1], Abouzar Bagheri[2]

1. Department of Toxicology and Pharmacology, Faculty of Pharmacy Mazandaran University of Medical Sciences, Sari, Iran
2. Department of Clinical Biochemistry-Biophysics and Genetics, Molecular and Cell Biology Research Center, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Depression is a very common mental disorder and a mitochondrial disease according to its mechanism. In the present study, we examined the mechanisms of action of isolated brain mitochondria in rats with depression for the first time. This will help identify the mitochondrial protective pathways of the two drugs and shed light on new therapeutic goals for developing antidepressants.

Methods : Forced swimming, tail suspension, and sucrose preference tests were used to assess depressive-like behaviors and the oxidative stress factors of brain tissue, and measure the gene expression of apoptotic and anti-apoptotic, neuroplasticity, and neuroinflammatory factors by RT-PCR and AChE activity in brain tissue (hippocampus and prefrontal) and the serum levels of corticosterone and fasting blood sugar.

Results : The results showed that the separation of neonatal rats from mothers induced depressive-like behaviors and cause weight loss, decreased pleasure and reluctance to consume sucrose, also Rats with depression-like behaviors don't try to escape and overcome their distressing situation. Chronic stress also, disrupt mitochondrial function, increase oxidative stress factors (ROS, LPO, MMP), and decrease antioxidant reserves (GSH). Also cause, increased expression of genes involved in: neuroinflammation (IL-6, TNF) and apoptosis (BAX). Increased expression of the P75Ntr and Sortilin genes in the brain indicates depressive-like behaviors which is a precursor to apoptosis and inflammatory factors. The expression of BDNF and its receptor TrkB and anti-apoptosis factor (BCL-2) decrease in both the cortices. Depression disrupts the cholinergic system, resulting in increased AChE levels. The increase in enzyme activity in the hippocampal cortex was

greater than that in the prefrontal cortex. Changes in serum corticosterone levels are important consequences of stress and depression. In the depression group, corticosterone levels increased significantly. Treatment with different concentrations of minocycline and edaravone (1, 20, 50 mg/kg), 5MTHF and citalopram for 14 days showed that these drugs improved depression-like behaviors and mitochondrial function. It also reduced the expression of genes involved in neuroinflammation, apoptosis, and depression and increased the expression of genes involved in mood.

Conclusion : In conclusion, minocycline and edaravone and also 5MTHF have neuroprotective, mitochondrial protective, antioxidant, anti-inflammatory, and anti-apoptotic effects against depressive-like behaviors caused by chronic stress.

Keywords : Depression; Maternal Separation; Mitochondria; Neuroprotective; Edaravone; Minocycline

Count: 324
Abstract ID: 96
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Investigation of Long-term effects of repeated exposure to Sevoflurane anesthesia during neonatal, pre-adolescence and adulthood on behavior deficits and cognitive impairment in adult male rats Wistar

Submission Author: Mahdieh Nasiri varzeghani

Mahdieh Nasiri varzeghani[1], Seyed Khalil Pestehei[2], Javad Fahanik-babaei[3]

1. Electrophysiology Research Center, Neuroscience Institute, Tehran University of Medical Sciences. Tehran, Iran.
2. Neuroscience Institute, Tehran University of Medical Sciences. Tehran, Iran. Department of Anesthesiology, Tehran University of Medical Sciences, Tehran, Iran.
3. Electrophysiology Research Center, Neuroscience Institute, Tehran University of Medical Sciences. Tehran, Iran.

Background and Aim : Objective(s): Repeated exposure to anesthesia is necessary for some therapeutic interventions. Anesthetics during neonatal or pre-adolescence can induce cell death, cognitive problems and later neurobehavioral problems in adulthood. The current study was aimed at providing detailed morphological and functional evaluations of the long-term impacts of repeated sevoflurane exposure on neonatal, pre-adolescence and adulthood.

Methods : Methods: Thirty-two male rats were randomly divided into four group: control, inhaling sevoflurane groups (concentration of 2% daily for 14 days) including groups of neonatal, preadolescence and adult. Influence on behavioral function of repeated exposure to sevoflurane was tested using Morris water maze tests. Effects of sevoflurane on synaptic plasticity was compared in the performant pathway of the CA1 of the hippocampus with field excitatory postsynaptic potentials (fEPSP) method.

Results : Results: Our results indicated that there is significant difference between the sevoflurane groups compared to the control group for latency in the first entry to the target and total time spent in the target quadrant in Morris water maze. In addation to, there is significant difference between the anesthesia exposure groups in age. Electrophysiological recordings indicated impaired long-term potentiation (LTP) and pair pulse in adult animals that received repeat exposures to anesthesia. our result also showed that there is significant difference in neonatal compared to pre-adolescence and adult groups.

Conclusion : Conclusion: Our results indicated that repeated exposure to sevoflurane during different age can cause neurobehavioral problems and cognition impairment later in adulthood. These results may provide a new perspective for understanding the mechanism of repeat exposure of anesthesia toxic effects in different age.

Keywords : sevoflurane; anesthesia; pre-adolescence; neonatal; cognitive problems; synaptic plasticity

Count: 325
Abstract ID: 232
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Ferulic Acid Ameliorates Dexamethasone-induced Cognitive Decline By Targeting Hippocampal Oxidative Stress and Pyroptosis

Submission Author: Saeid Iranzadeh

Saeid Iranzadeh[1], Fatemeh Khajat[2], Alireza Azizzadeh-Delshad[3], Mehrdad Roghani[4]

1. Student Research Committee, Faculty of Medicine, Shahed University, Tehran, Iran
2. School of Medicine, Shahed University, Tehran, Iran
3. Department of Anatomy, School of Medicine, Shahed University, Tehran, Iran
4. Neurophysiology Research Center, Shahed University, Tehran, Iran

Background and Aim : Long-term exposure to high doses of glucocorticoids such as dexamethasone (DEX) damages different parts of the central nervous system such as the hippocampus and causes functional impairment. DEX exerts its neurotoxic effects by provoking oxidative stress and apoptotic cell death. Ferulic acid (FA) is a well-known herbal compound that has shown potential antioxidant, anti-apoptotic, and anti-inflammatory effects and shows promise in treating various disorders. In the present study, we aimed to investigate the neuroprotective effects of FA on DEX-induced hippocampal injury in rats.

Methods : Thirty-two male Wistar rats were randomly divided into four groups: control, FA-treated control, DEX, and FA-treated DEX. The neuronal injury was induced by DEX (500 µg/kg/day; i.p.) and FA-treated groups received FA (50 mg/kg/day; p.o.) 1 h after DEX for three weeks. Cognitive performance was assessed with different tasks. Additionally, oxidative stress and apoptotic-associated markers were measured and hippocampal histochemical analysis was also performed.

Results : FA at a dose of 50 mg/kg significantly improved the discrimination ratio in the novel object recognition (NOR) task and averted step-through latency reduction in the passive avoidance test. Furthermore, FA reduced inappropriate hippocampal malondialdehyde (MDA) level and caspase-1 activity. FA additionally hindered neuronal loss caused by DEX in the CA1 field of the hippocampus.

Conclusion : FA can be considered as a potential candidate to protect against long-term DEX-induced cognitive deficits and hippocampal injury via alleviating hippocampal oxidative stress and pyroptosis.

Keywords : Ferulic Acid; Dexamethasone; Oxidative stress; Pyroptosis; Hippocampus

Count: 326
Abstract ID: 408
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Fumaria villantii extract protects against 6-hydroxydopamine-induced neurotoxicity

Submission Author: Hanieh Javid

Hanieh Javid[1], Rana Rahimian[2], Anahita Torkaman-Boutorabi[3]

1. Tehran University of Medical Science
2. Islamic Azad University Karaj Branch Faculty of Sciences Department of Biology
3. Tehran University of Medical Science

Background and Aim : Parkinson's disease is a neurological disorder caused by the loss of dopaminergic neurons in the middle brain. There are various mechanisms involved in causing this disease. Including stress oxidation which has a significant role in the incidence of this disease. Extracts of various herbs and substances due to their antioxidant properties have the ability to counteract oxidative stress. Including fumaria villantii extract which has antioxidant properties. The aim of this study was to investigate the neuroprotective effect of Fumaria vaillantii extract on Parkinson's in vitro model.

Methods : Toxicity was induced by 6-hydroxydopamine in PC12 cells. The protective effects of the extract on cell survival were measured by cell viability assay (MTT). Cell apoptosis and cell density were also evaluated qualitatively by Hoechst staining and the antioxidant activity of the extract was determined by oxygen free radical assay.

Results : Results from measurements and tests indicate that Fumaria vaillantii extracts induce cell survival after induction of toxicity, prevent cell apoptosis, and reduce oxygen free radicals in cells.

Conclusion : In summary, the study shows that treatment with Fumaria vaillantii extract inhibits Parkinson's disease by inhibiting oxidative stress.

Keywords : Parkinson's disease, Fumaria vaillantii, 6-OHDA, ROS, neuroprotection

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023
Tehran, Iran

Count: 327
Abstract ID: 204
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Pre-clinical Studies Identifying Molecular Pathways of Neuroinflammation in Parkinson's Disease: A Systematic Review

Submission Author: Mobina Fathi

Mobina Fathi[1], Kimia Valkili[2], Shirin Yaghoobpoor[3]

1. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Parkinson's disease (PD), the second most common neurodegenerative disorder, is characterized by neuroinflammation, formation of Lewy bodies, and progressive loss of dopaminergic neurons in the substantia nigra of the brain. In this review, we summarize evidence obtained by animal studies demonstrating neuroinflammation as one of the central pathogenetic mechanisms of PD. We also focus on the protein factors that initiate the development of PD and other neurodegenerative diseases.

Methods : Our targeted literature search identified 40 pre-clinical in vivo and in vitro studies written in English.

Results : Nuclear factor kappa B (NF-kB) pathway is demonstrated as a common mechanism engaged by neurotoxins such as 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) and 6-hydroxydopamine (6-OHDA), as well as the bacterial lipopolysaccharide (LPS). The α-synuclein protein, which plays a prominent role in PD neuropathology, may also contribute to neuroinflammation by activating mast cells. Meanwhile, 6-OHDA models of PD identify microsomal prostaglandin E synthase-1 (mPGES-1) as one of the contributors to neuroinflammatory processes in this model

Conclusion : Immune responses are used by the central nervous system to fight and remove pathogens; however, hyperactivated and prolonged immune responses can lead to a harmful neuroinflammatory state, which is one of the key mechanisms in the pathogenesis of PD.

Keywords : Parkinson's disease, nuclear factor kappa B (NF-κB), NLRP3 inflammasome, microglia, mast cells, neuroinflammation

Count: 328
Abstract ID: 182
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Methamphetamine increases oxidative stress in the periaquadactal gray matter in rats

Submission Author: Hossain Mohammad Pour Kargar

Hossain Mohammad Pour Kargar[1], Hossein azizi[2], Mohammad Reza Bahrami[3]

1. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
2. Departmen of Physiology, Faculty of medical science, Tarbiat Modares University, Tehran, Iran
3. Faculty of Pharmacy, Islamic Azad University, Damghan Branch, Damghan, Iran

Background and Aim : Methamphetamine, a potent psychostimulant drug, has destructive effect on the nervous system. Methamphetamine elevates amount of the dopamine and norepinephrine in the brain. It has been shown that dopamine accumulation leads to oxidative stress and finally induces brain damage. In this study, effects of the intraperitoneal administration of methamphetamine on oxidative stress in the brain periaqueductal gray were investigated.

Methods : Male Wistar rats were allocated into 2 equal groups: 1) control and 2) Methamphetamine groups Rats received high methamphetamine doses repeatedly (2×20 mg/kg, 2 hour interval). After 7 days, rats were anesthetized, their brains were extracted and after preparing periaquadactal gray matter homogenates, malondialdehyde (MDA) level, catalase and superoxide dismutase (SOD) activities were evaluated.

Results : Statistical analysis showed that injection of methamphetamine not only increased MDA level but also reduced CAT and SOD activities in the periaqueductal gray matter region.

Conclusion : Our results showed that administration of the methamphetamine increased oxidative stress in the brain periaqueductal gray region. It was reported that methamphetamine increases release of dopamine, serotonin and specially glutamate neurotransmitters in the brain. Furthermore, it has been shown that excessive release of glutamate leads to glutamate-mediated neurotoxicity which leads to the activation of calcium-dependent proteolytic enzymes and finally increases free radicals production. Neuronal damage by free radicals is considered as a main mechanism for methamphetamine neurotoxicity.

Keywords : Methamphetamine, Periaqueductal gray, Oxidative stress

Count: 329
Abstract ID: 183
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Alpha-lipoic acid decreased pain sensation in the methamphetamine-treated rats

Submission Author: Hossain Mohammad Pour Kargar

Hossain Mohammad Pour Kargar[1], Hamid Noshiri[2]

1. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
2. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran

Background and Aim : Alpha-lipoic acid is essential for aerobic metabolism and acts as a potent antioxidant in the body. Methamphetamine is an addictive psychostimulant which prevalent among young adults. This drug easily diffuses through the blood–brain barrier and affects neuronal terminals. As the effects of methamphetamine in CNS are majorly dependent on interaction with dopamine, norepinephrine and serotonin systems, it is possible that acute exposure to methamphetamine can affects nociceptive systems and change pain perception in animals. In this study, preventive effect of the alpha-lipoic acid on pain sensation in methamphetamine-induced neurotoxicity was investigated.

Methods : 35 male rats were allocated to 6 groups: 1) saline+saline, 2) saline+ vehicle (sunflower oil as alpha-lipoic acid solvent), 3) methamphetamine+vehicle, and two methamphetamine groups under treatment with alpha-lipoic acid (10 and 40mg/kg). Rats received methamphetamine repeatedly (2×20 mg/kg, 2 hour interval) and alpha-lipoic acid was injected 30 min, 24 h and 48 h after the last methamphetamine injection. Tail flick test was used for evaluation of pain sensation. Comparison of experimental groups was performed by one way ANOVA followed by LSD post hoc test.

Results : Statistical analysis showed that injection of saline or sunflower oil had no effect on pain score. Methamphetamine administration induced hyperalgesia and reduced tail flick latency ($P<0.001$) significantly. Treatment with alpha-lipoic acid, decreased hyperalgesia and increased tail flick latency in both doses ($P<0.05$).

Conclusion : It has been suggested that neuroinflammation, alternation in the neurotransmission or oxidative stress are the most contributing factors which involve in the methamphetamine neurotoxicity. Alpha-lipoic acid (ALA) is a potent natural antioxidant in the body. It seems that alpha-lipoic acid by reducing neuro-inflammation or oxidative stress protects brain from adverse effects of methamphetamine.

Keywords : Methamphetamine, Alpha-lipoic acid, Pain, Tail flick

Count: 330
Abstract ID: 194
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Bilateral lesion of Paragigantocellularis Lateralis (LPGi) nucleus postpone morphine withdrawal syndrome initiation in male rats: A time-dependent study

Submission Author: Masume Zare

Masume Zare [1], Hossain Mohammad pourkargar[2], Kesmati M[3], Fathi Moghaddam H[4]

1. -
2. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
3. Department of Biology, School of Sciences, Shahid Chamran University, Ahwaz, Iran
4. Department of Physiology & Physiology Reseach Center, Jondishapour University of Medical Sciences, Ahwaz, Iran

Background and Aim : Physical dependence results in exposure with chronic morphine and is manifested by physical symptoms during naloxone-precipitated withdrawal signs in animals. The determination of the neural pathways and nuclei that involve in withdrawal syndrome are important fields in neuroscience. Paragigantocellularis lateralis (LPGi) is an important nucleus in medulla that plays an essential role during opioids dependence. In this research we investigated the role of LPGi nucleus during morphine withdrawal behaviors expression.

Methods : In this study 24 rats weighting (180-220g) were used. Rats devided into control, sham and lesion groups. After anesthetizing with ketamine and xylazine mixture and using stereotaxic apparatus, bilateral LPGi lesion was induced by electrical current (1 m A for 6 sec). Morphine dependency was induced by i.p. injection of morphine for 4 days and 2 times in a day (25, 30, 35, 40 mg/kg respectively). Withdrawal syndrome was induced by naloxone injection (20 mg/kg, i.p.). Withdrawal signs (paw tremor, ejaculation, wet dog shakes, body tremor, defecating, chewing, teeth chattering, ptosis and grooming) were evaluated for 30 minutes. Comparison of experimental groups was performed by one way ANOVA followed by LSD post hoc test.

Results : Statistical analysis showed that LPGi bilateral lesion reduced withdrawal signs during 0-5 min ($P<0.015$) and 15-20 min ($P<0.015$). we did not find any significant differences in withdrawal signs during 5-10 min, 10-15 min and 20-30 min.

Conclusion : Our results showed that presence of the LPGi is necessary for withdrawal signs expression in initiation phase and during 15-20 minutes. It seems that LPGi has a critical role on withdrawal signs only in these minutes, especially during withdrawal initiation. In other minutes, LPGi didnot involve in withdrawal signs and probably other nuclei or adjacent area such as PGi may play important role.

Keywords : Paragigantocellularis lateralis; Electrical lesion; Morphine, Withdrawal syndrome;

Count: 331
Abstract ID: 196
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The role of alpha 2-adrenoceptor activation during morphine withdrawal syndrome in male rats: A time-dependent study

Submission Author: Masume Zare

Masume Zare [1], Hossain Mohammad pour kargar[2], Kesmati M[3], Fathi Moghaddam H[4]

1. -
2. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
3. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
4. Department of Physiology & Physiology Reseach Center, Jondishapour University of Medical Sciences, Ahwaz, Iran

Background and Aim : Alpha2-adrenergic agonists suppress the signs of opiate withdrawal in animals and human. Clonidine, an adrenergic partial agonist, blocks the rewarding effect of morphine in morphine withdrawn rats as well as decreases withdrawal syndrome. It has an agonistic effect in low doses and antagonistic effect in high doses. This drug inhibits naloxone-induced increases in firing noradrenergic neurons in morphine-dependent rats. In this research we investigated the effect of clonidine as alpha-2 adrenergic receptor agonist on morphine withdrawal sings in a time dependent manner.

Methods : In this study 28 rats weighting (180-220g) were used. Rats divided into control and three groups that received 0.02,0.2 and 2 mg/kg clonidine intraperitoneally. Morphine dependency was induced by i.p. injection of morphine for 4 days and twice in a day (25, 30, 35, 40 mg/kg respectively). Withdrawal syndrome was induced by naloxone injection (20 mg/kg, i.p.). Clonidine was injected 30 min after the last morphine injection. After 30 min withdrawal signs (paw tremor, ejaculation, wet dog shakes, body tremor, defecating, chewing, teeth chattering, ptosis and grooming) were evaluated for 30 minutes. Comparison of experimental groups was performed by one way ANOVA followed by LSD post hoc test.

Results : Statistical analysis showed that administration of 0.02 mg/kg clonidine decreased (P<0.01) withdrawal signs during 10-30 min. Other doses did not affect withdrawal syndrome.

Conclusion : Our results showed that clonidine at low dose (0.02 mg/kg) decreased the withdrawal syndrome during 10-30 min and other doses did not affect the signs. Probably it is related to the

partial agonistic effect of clonidine. There are several reports that indicate clonidine potentiates some withdrawal signs. Also it has been reported that higher doses of clonidine increases the firing rate of neurons. It is possible that clonidine in high doses affects imidazoline-1 receptors or alpha 1-adrenoceptors and attenuate the effect of alpha 2-adrenoceptors on withdrawal signs.

Keywords : Alpha2-adrenergic agonists; Clonidine; Morphine, Withdrawal syndrome

Count: 332
Abstract ID: 197
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The effect of clonidine administration on morphine withdrawal syndrome in paragigantocellularis Lateralis (LPGi) nucleus lesioned rats: a time dependent study

Submission Author: Masume Zare

Masume Zare [1], Hossain Mohammad pour kargar[2], Kesmati M[3], Fathi Moghaddam H[4]

1. -
2. Department of biology, Islamic Azad University, Damghan Branch, Damghan, Iran
3. Department of Biology, School of Sciences, Shahid Chamran University, Ahwaz, Iran
4. Department of Physiology & Physiology Reseach Center, Jondishapour University of Medical Sciences, Ahwaz, Iran

Background and Aim : Clonidine, an adrenergic partial agonist, suppresses the signs of morphine withdrawal in animals. Brain regions that are affected by this drug remain unknown. In this research, we investigated the effect of clonidine on morphine withdrawal sings in LPGi lesioned rats in a time dependent manner.

Methods : In this study 35 rats weighting (180-220g) were used. Rats divided into sham, lesion and three lesion groups that received 0.02 mg/kg, 0.2 mg/kg and 2 mg/kg clonidine intraperitoneally. After anesthetizing with ketamine and xylazine mixture and using stereotaxic apparatus, bilateral LPGi lesion was induced by electrical current (1 m A for 6 sec). Drug dependency was induced by i.p. injection of morphine for 4 days and 2 times in a day (25, 30, 35, 40 mg/kg respectively). Clonidine (0.02 , 0.2 and 2 mg/kg, i.p.) was injected 30 min after last morphine injection. After 30 min, withdrawal syndrome was induced by naloxone injection (20 mg/kg, i.p.). Withdrawal signs (paw tremor, ejaculation, wet dog shakes, body tremor, defecating, chewing, teeth chattering, ptosis and grooming) were evaluated for 30 minutes. Comparison of experimental groups was performed by one way ANOVA followed by LSD post hoc test.

Results : Statistical analysis showed that three doses of clonidine decreased withdrawal syndrome in 5-10 min ($P<0.008$). During 10-15 min, 0.2 mg/kg ($P<0.01$) and 2 mg/kg ($P<0.038$) clonidine decreased withdrawal syndrome significantly. We did not find any significant differences between groups in 15-30 min.

Conclusion : It has been suggested that ability of clonidine on withdrawal signs attenuation, may be due to the reduction of noradrenergic neuronal activity originating in the LC. But Lesion studies have indicated that the noradrenergic neurons of the locus ceruleus are not essential for opiate withdrawal. It was reported that effect of clonidine on withdrawal signs were mediated by alpha-2 adrenergic receptors in other brain regions. It seems that LPGi alpha-2-adrenergic receptors have an important role During 5-15 minutes and attenuation effects of clonidine on withdrawal syndrome may mediate by these receptors.

Keywords : Paragigantocellularis lateralis; Electrical lesion; Morphine, Withdrawal syndrome;Clonidine

Prunus amygdalus var amara essential oil suppressed morphine induced cell death

Submission Author: Hossein Zhaleh

Hossein Zhaleh[1], Zhila Dinari [2]

1. Substance Abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Department of Medicinal Plants Institute of Higher Education, Kermanshah, Iran

Background and Aim : High concentration of morphine induces cell death through increase the cell cytotoxicity, production of Nitric oxide, inflammatory cytokines, and caspase-3 in central nervous system. Purpose of this research, is study of inhibitory effects of Prunus amygdalus var amara essential oil on morphine-induced cell death in neuron-like cells, PC12.

Methods : The Gas Chromatography Mass Spectroscopy GC-MS used to chemical analysis of Prunus amygdalus var amara essential oil. The cell viability, cell proliferation, and cell cytotoxicity were analyzed by Lactate dehydrogenase (LDH) tests. DNA fragmentation was detected by Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) test. NO production measured through Griess reaction. Inflammatory cytokines of IL-1β, IL-6, INFγ, and TNFα were analyzed by Rat V-Plex Kit.

Results : GC-MS indicated that Benzaldehyde and Benzoic acid are the most frequently found chemical constituents in Prunus amygdalus var essential oil. All Prunus amygdalus var essential oil treatments were shown higher proliferation and viability and lower cytotoxicity and cell death index compared to morphine-treated cells. Production of NO, IL-1β, IL-6, INFγ, and TNFα release were decreased in presence of Prunus amygdalus var essential oil while mitochondrial membrane potential decreased.

Conclusion : We concluded that Prunus amygdalus var essential oil suppressed the cell death which induced by morphine in PC12 cells. It can inhibit the production of NO. Also, it can inhibit apoptosis through inhibition of DNA fragmentation, and disruption of mitochondrial membrane.

Keywords : Morphine, Cell Death, Inflammation, Prunus amygdalus var amara essential oil

Count: 334
Abstract ID: 93
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

effects of Pentoxifylline on neuroinflammation in PC12 cells by Methamphetamine

Submission Author: Hossein Zhaleh

Hossein Zhaleh[1], Komail Amini [2], Mohammad Reza Neurani [3], Ramezan Ali Taheri [4]

1. Substance Abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Department of Biotechnology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran
3. Nano biotechnology research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
4. Nano biotechnology research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

Background and Aim : Methamphetamine abuse was a global concern in last few decades. 3.5 million People have been affected from methamphetamine abuse and this is rising. Methamphetamine induces apoptosis in most cell lines. Pentoxyphilline as a phosphodiesterase inhibitor, seems to have the ability of inflammation reduction and thus has the ability to reduce methamphetamine-induced cell death.

Methods : In this study, PC12 cells were grown in DMEM culture medium. so we used MTT test for cell viability detection, LDH test for cytotoxicity measurement, the caspase activity colorimetric assay kit (Bio-techne) for caspase 3 activity diagnosis, rhodamine 123 for detection of mitochondrial membrane potential, and fluorescence microscope for measurement of antioxidant enzyme activities.

Results : Pentoxyphilline increased cell viability and rhodamine-123 absorbance and reduced cell cytotoxicity, caspase-3 activity, and (.OH) generation in all concentrations of 1 nM to 100 μM ($p<0.05$) with optimal concentration of 100 μM.

Conclusion : Pentoxyphilline as a phosphodiesterase inhibitor can reduce the methamphetamine-induced cell death significantly by its anti-inflammatory effects.

Keywords : Methamphetamine, Pentoxyphilline, Apoptosis, Cell death

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Count: 335
Abstract ID: 143
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

A review of inflammatory effects of microRNA alterations on Alzheimer's disease pathogenesis

Submission Author: Morteza Nazari Khiji

Morteza Nazari Khiji[1], Maryam poorsaadat[2]

1. Student research committee, Sabzevar University of Medical Sciences, Sabzevar, Iran
2. Student Research Committee, Sabzevar University of Medical Sciences, Sabzevar, Iran

Background and Aim : Alzheimer's disease (AD) is a progressive debilitating neurodegenerative disease and mainly associated with cognitive decline. AD is characterized by hyperphosphorylation of tau proteins, the formation of senile plaques of Aβ and neuroinflammation in the brain. MicroRNAs (miRNAs), a class of non-coding RNAs, are widely distributed in the central nervous system (CNS) and involve in the complicated pathogenesis of AD through a variety of mechanisms. There is still lack of knowledge about this mechanisms. In this paper, we aimed to review the effects of inflammation induced by microRNA alterations on AD pathogenesis.

Methods : A search was conducted on PubMed, Cochrane Library, and Web of Science databases from 2010 to 2022 using the terms "MicroRNAs", "Alzheimer's disease", "Neuroinflammation".

Results : AD research has revealed that miRNAs are involved in the inflammatory response and cellular changes. They interfere with gene regulation and translation and play a key role in the post-translational regulation of gene expression. Several miRNAs have been so far identified to be likely involved in the regulation of microglial functions or are differentially expressed in astrocytes. With regards to neuroinflammation, the miR-124, miR-155 and miR-146a play a pivotal role in the regulation of microglial phenotype by promoting microglial quiescence (miR-124), or by driving microglial inflammatory and immune response (miR-155 and miR-146a). Such inflammatory response, i.e. release of cytokines, complement components, chemokines, is known to contribute to beta-amyloid (A?) production and accumulation and finally AD pathogenesis. Accumulating evidence shows that exposure of astrocytes to A? alters miRNA expression. Higher levels of proinflammatory miRNAs in astrocytes were shown to induce the prolonged-expression of proinflammatory cytokines. Other Key miRNAs including pro-inflammatory (miR-326, miR-27b, miR-125b) and anti-inflammatory (miR-21, miR-223) miRNAs affect the neuroinflammation

in AD. Upregulation of this pro-inflammatory miRNAs increases the release of cytokines and promote AD progression.

Conclusion : Eventually, growing evidence indicates that miRNAs play a crucial role in neuroinflammation associated with AD progression. Using miRNAs could be useful as diagnostic or therapeutic strategy for AD.

Keywords : MicroRNAs, Alzheimer's disease, Neuroinflammation

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

The effect of N-acetylcysteine on the infract volume and neurological deficit scores caused by stroke in male Wistar rats

Submission Author: Hanie Dehghani

Hanie Dehghani[1], Mohammad Reza Bigdeli[2], Samira Vahidi[3], Mahmoud Ramdan[4]

1. Department of Animal Sciences-Physiology, Faculty of Life Sciences, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive and Brain Science, Shahid Beheshti University, Tehran, Iran
3. Department of Animal Sciences-Physiology, Faculty of Life Sciences, Shahid Beheshti University, Tehran, Iran
4. Department of Animal Sciences-Physiology, Faculty of Life Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : Inflammation is one of the major mediators of ischemic stroke, which plays a substantial role in its underlying pathology. It has been observed that inflammatory markers increase within a few hours after an ischemic stroke and it is predicted that by inhibiting inflammatory mechanisms. According to studies, N-acetylcysteine (NAC) can reduce inflammation caused by stroke. Therefore, the aim of this study was to investigate the effect of N-acetylcysteine on infract volume (IV) and neurological deficit scores (NDS) caused by ischemic stroke.

Methods : 21 adult male Wistar rats weighing between 300-250 grams were used in 3 groups: control, sham and the intervention group which received N-acetylcysteine at the rate of 150 mg per kilogram of body weight. The control and intervention groups were exposed to the middle cerebral artery occlusion (MCAO) model, and after 24 hours, the neurological deficit scores and infract volume in total, cortex, Pri-Amygdala and striatum were examined.

Results : In total, the behavioral defects in the group receiving NAC decreased with $p<0.00001$, and there was also a significant difference in motor ($p<0.05$) and sensory ($p<0.01$) defects. In addition, there was a significant decrease in the infract volume in the drug receiving group compared to the control group ($p<0.0001$) in the cortex ($p<0.0029$), pri-amygdala ($p<0.012$) and striatum ($p<0.0136$).

Conclusion : This study showed that N-acetylcysteine can reduce the NDS and IV. it can be a potential option to manage stroke more appropriately.

Keywords : N-acetylcysteine; Infarct volume (IV); Neurological Deficits.

Count: 337
Abstract ID: 129
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Effect of pretreatment with Devil's claw on locomotor activity, infarct volume and neuronal density in focal cerebral ischemia in rats

Submission Author: Hossein Zarei

Hossein Zarei[1], Shima Shirzad[2], Mona Riyahi RadNeuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran[3], Mohhamad Rezaie[4], Hamed Ghazavi[5], Farzaneh Vafaee[6]

1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
3. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
4. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
5. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
6. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Ischemic stroke is caused by a blockage in the arteries, which leads to damage or death of brain cells due to the reduction of blood flow and oxygen in the brain and therefore, is very debilitating. Ischemic strokes include approximately 87% of all strokes. Devil's claw plant is a native African plant, used to treat inflammatory pain such as rheumatism. Various studies have shown that this plant has anti-inflammatory, antioxidant, and neuroprotective properties. However, so far no study has investigated the effect of this plant on acute brain damage such as stroke. In this study, we investigated the effect of pretreatment with the devil's claw plant in improving motor activity, lesion volume, and neuronal density changes in the penumbra region following the induction of focal ischemic stroke in rats.

Methods : In this study, 40 Wistar male rats were used, and were divided into 4 groups. 1) Sham group: which only underwent surgery and brain ischemia was not induced in them. 2) Control group: They were subjected to focal ischemia induction surgery on the right side. 3 and 4) groups treated with Devil's claw extract with doses of 200 and 400 mg/k: animals in these groups received Devil's claw plant extract by gavage 30 days before surgery. 24 hours after surgery, open field, rotarod, and Ruger tests were taken from all animals. At the end of the behavioral tests, the brain tissue was removed. The neuronal density was investigated by stereological technique with Nissel staining and the infarct size with TTC staining.

Results : The results of this study show that the animals that received Devil's claw extract had a significant difference in the duration of staying in the rotarod test compared to the control group. In addition, the performance of animals receiving a dose of 400 Devil's claw was significantly better than the low dose. Moreover, the animals in the treatment group had better movement in the open-field test than the control group. There was no significant difference between the two doses in the open-field test. The size of the infarct in the treatment groups was significantly reduced compared to the control group. Neuronal density in the penumbra area in the treatment groups increased significantly compared to the control group. Both of these parameters improved more in the higher dose than in the lower dose.

Conclusion : It seems that Devil's claw plant extract can prevent secondary inflammation caused by ischemic stroke due to its strong antioxidant and anti-inflammatory effects.

Keywords : Effect of pretreatment with devil's claw, focal ischemia, neuronal density, infarct volume

Count: 338
Abstract ID: 81
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Riboflavin ameliorates oxidative stress following rat cerebral ischemia-reperfusion injury

Submission Author: Seyedeh Mahdieh Khoshnazar

Seyedeh Mahdieh Khoshnazar[1]

1. Physiology Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Oxidative stress has a critical role in the pathogenesis of cerebral ischemia. Riboflavin (vitamin B2) is a water-soluble vitamin that is converted into active coenzyme forms in various metabolic reactions. Lack of vitamins and antioxidants leads to increased pathology in stroke patients. Studies show that riboflavin (vitamin B2) has promising neuroprotective effects.

Methods : 21 male Wistar rats weighing 260-300 were randomly divided into 3 groups the sham group, the ischemia-saline group, and the ischemia-riboflavin group. Ischemia was induced by occlusion of both common carotid arteries (CCA) for 20 min. Then riboflavin at a dose of 10 mg/kg of body weight was injected intraperitoneally at the beginning of reperfusion. malondialdehyde (MDA) was measured by the thiobarbituric acid method. Inducible nitric oxide synthase (iNOS) levels in the hippocampus were measured by ELISA.

Results : Chemocolorimetry was used to measure the brain MDA levels. As presented in Fig. 1, cerebral I/R increased the brain MDA levels to 11.38 ± 4.25 mg/ml, whereas riboflavin significantly reduced this level to 6.33 ± 1.74 mg protein/ml ($P<0.01$; Fig. 1). Furthermore, cerebral I/R increased the iNOS levels in the focal ischemic cerebral hippocampus to 27.43 ± 7.11 U/mg protein, compared with the sham group (18.01 ± 5.66 U/mg protein). riboflavin significantly reduced iNOS levels to 20.17 ± 6.49 ng/ml (Fig. 2).

Conclusion : In conclusion, the results in the current study showed that treatment with riboflavin significantly reduced levels of MDA, iNOS.Thus, riboflavin may protect against cerebral I/R injury by ameliorating oxidative stress.

Keywords : Riboflavin, Stroke, cerebral ischemia-reperfusion, inducible nitric oxide synthase, malondialdehyde

Count: 339
Abstract ID: 53
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Mesenchymal Stem Cell-Based Therapy for Cerebral Ischemic Stroke

Submission Author: Zahra Maharat

Zahra Maharat[1], Dr. Abolghasem Esmaeili[2]

1. University of Isfahan, Biological Science and Technology, Department of Cell and Molecular Biology and Microbiology
2. University of Isfahan, Biological Science and Technology, Department of Cell and Molecular Biology and Microbiology

Background and Aim : Adult bone marrow-derived mesenchymal stem cells (MSCs) display a spectrum of functional properties. Transplantation of these cells improves clinical outcomes in models of cerebral ischemia and spinal cord injury via mechanisms that may include replacement of damaged cells, neuroprotective effects through releasing trophic factors, induction of axonal sprouting, and neovascularization. In the present study, it is investigated the therapeutic benefit of MSCs transplantation during the acute phase of ischemic stroke.

Methods : Rodent MSCs were transplanted in the rodent cerebral ischemic model. Lesion volume was calculated by magnetic resonance imaging and TTC stained sections. Autologous MSCs obtained from bone marrow aspiration, with CD34–, CD45–, CD73+, and CD105+ cell surface antigen patterns, were cultured with patient-derived serum using methodologies that allowed culturing of autologous human MSCs (ahMSCs) to very high homogeneity. 30 patients, with cerebral infarcts in the middle cerebral artery (MCA) territory and severe neurological deficits, received intravenous infusions of ahMSCs at 4–5 and 7–9 weeks after symptom onset. The patients were studied over the course of a year.

Results : Transplantation of rodent MSCs after induction of cerebral ischemia can reduce infarct size and improve functional outcomes. Lesion volume is reduced following intravenous infusion of MSCs. In the first Clinical studies of intravenously delivered human MSCs in stroke patients, the MSCs group showed greater functional recovery with no deaths, stroke recurrence, or serious adverse events. A 5-year follow-up confirmed that there were no adverse events after transplantation of human MSCs in these stroke patients. MRIs following cell injection showed no tumor or abnormal cell growth in any of the patients over 1 year. There were improvements in the National Institutes of Health stroke score (NIHSS) and lesion volume within the first weeks after

cell infusion. Notably, the recovery rate dramatically improved within the first 2 weeks after ahMSC injections in some of these patients. Moreover, there was a steep reduction in lesion volume during the first 2 weeks post-cell infusion, and lesion volume reduction correlated with functional improvement. Serial evaluations showed no severe adverse cell-related, serological, or imaging-defined effects.

Conclusion : Systemically delivered MSCs have been examined in clinical studies for a number of neurological diseases. MSCs have the capacity to release growth and trophic factors from resident brain cells leading to reduce apoptotic cells, promoting endogenous cell proliferation, particularly in the penumbra, and anti-inflammatory responses wif reduction of neural edema at the lesion boundary. Wif increased time, MSCs may contribute to neovascularization, vascular stabilization, and remodeling of the BBB, theirby protecting CNS tissue and limiting cerebral edema. MSCs may also stimulate local axonal sprouting wif new synaptic connections. Finally, the MSCs could mobilize resident progenitor cells dat may contribute to neurogenesis and axon remyelination. One potential advantage of a cell-based therapy dat delivers trophic factors to injury sites rather TEMPthan systemic pharmacological delivery is the reduction in potential adverse effects of systemic drug delivery. These data suggest dat MSCs transplantation can be useful for cerebral ischemia therapy and may represent a new strategy for the treatment of stroke in the future.

Keywords : Cerebral Ischemic Stroke; Mesenchymal Stem Cell, Cell-based Therapy

Count: 340
Abstract ID: 59
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Apoptosis status of the hippocampus in rats under chronic cerebral ischemia treated with berberine

Submission Author: Fatemeh Zare mehrjerdi

Fatemeh Zare mehrjerdi[1]

1. Department of Physiology, School of Medicine, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd. Iran

Background and Aim : Long-term reduction in cerebral blood flow, causes symptoms similar to vascular dementia. Vascular dementia occurs with age and following vascular destruction, which leads to damage to different areas of the brain. Among the areas involved are the hippocampus, prefrontal cortex and white matter. One of the most important functions of these brain areas is active participation in cognitive activities. Damage caused by increased oxidative stress or inflammatory factors play an important role in the activation of processes that lead to cell death. In this study, the effect of berberine on the process of apoptosis in chronic cerebral ischemia was investigated.

Methods : In this study, 18 Wistar rats were used in the weight range of 200-250. The animals were divided into 3 groups: sham, ischemia and ischemia treated with berberine (50mg/kg). Cerebral ischemia was caused by complete occlusion of the carotid arteries. Two months after the surgery, the animals were deeply anesthetized and after cardiac perfusion, the brain was completely removed. After sectioning samples, the amount of tissue apoptosis was assessed using the tunnel kit and the expression of caspase 3 protein was examined by immunohistochemistry method.

Results : The results of this study include that two months after the complete occlusion of the carotid arteries, the amount of apoptosis in the hippocampus increases. Apoptotic bodies are clearly visible in tunnel staining, and an increase in the amount of caspase 3 is also observed in the ischemic hippocampus. Also, the results of this study show a relative decrease in hippocampal apoptosis in ischemic rats treated with berberine.

Conclusion : Many studies have shown that chronic cerebral ischemia increases the rate of neuronal death in the form of necrosis, apoptosis and autophagy in areas of the brain such as the hippocampus and white matter. In this study, the amount of apoptosis increased in the hippocampus of ischemic animals. Activation of inflammatory pathways and increased oxidative stress are among the factors that activate cell death signaling pathways. Berberine is an important anti-inflammatory and antioxidant factor that has been effective in reducing cell death in various neurological disorders. In this study, berberine was able to reduce the amount of apoptosis in the hippocampus of ischemic animals.

Keywords : chronic cerebral hypo-perfusion, berberine, apoptosis, caspase 3

Count: 341
Abstract ID: 57
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Effects of SO2 donors on the oxidative status of the prefrontal cortex following chronic cerebral hypoperfusion

Submission Author: Fatemeh Zare mehrjerdi

Fatemeh Zare mehrjerdi[1]

1. Department of Physiology, School of Medicine, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd. Iran

Background and Aim : Sulfur dioxide (SO2) is one of the important air pollutants whose harmful effects on different parts of the human body and animals are well known, but many studies in recent years have proven the positive effects of endogenous SO2 on disorders such as atherosclerosis, lung infection, cerebral and cardiac ischemia, and hypertension. In this study, the effects of sulfur dioxide on the oxidative changes created in the prefrontal cortex following bilateral common carotid arteries occlusion (BCCAO)were investigated.

Methods : In this study, 24 Wistar rats were randomly divided into 3 groups: sham, BCCAO, BCCAO + SO2 donors (34 mg of Na_2SO_3 + 9 mg of $NaHSO_3$). To induce ischemia, the common carotid arteries were permanently occluded. Sulfur dioxide donors dissolved in distilled water and administered intraperitoneally daily. After 60 days, the animals were deeply anesthetized and their brains were removed and the prefrontal cortex was separated and kept at -80. To check the activity of enzymes and the level of MDA, after homogenizing and centrifuging the cerebral cortex sample, the supernatant was used to check the enzymes GSH, SOD and MDA level. The mentioned factors assessed according to the instructions of the Zelbio kit.

Results : The results of this study showed that the reduction of blood supply to the prefrontal cortex after ischemia causes a decrease in the activity of GSH and SOD enzymes ($p?0.001$, $p?0.05$) and an increase in the amount of MDA ($p?0.05$) and SO2 donors are able to recover the activity of enzymes and reduce the amount of MDA in the prefrontal cortex of ischemia group ($p?0.05$).

Conclusion : Many complications following ischemia are caused by increased oxidative stress. Due to the high need for energy and low antioxidant reserves, the brain is one of the most vulnerable organs against oxidative stress. Therefore, the use of factors with antioxidant properties can be useful in reducing the complications of cerebral ischemia. The antioxidant role of

endogenous SO2 has been investigated and proven in several studies, which is consistent with the results of the present study, which showed that SO2 donors are able to increase the activity of antioxidant enzymes and reduce lipid peroxidation.

Keywords : BCCAO, prefrontal cortex, SO2 donors, oxidative stress

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Count: 342
Abstract ID: 124
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Poststroke outcomes of stroke patients with type 2 diabetes by comparing insulin with oral hypoglycemic agents therapy

Submission Author: Arezoo Fathalizadeh

Arezoo Fathalizadeh[1], Samad Shams Vahdati[2], Mobina Oladghaffari[3], Reza Majidazar[4]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Emergency medicine research team, Imam Reza Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
4. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.

Background and Aim : Diabetes mellitus patients have an increased risk of ischemic stroke and subsequent adverse outcomes. There are limited data about the impact of prior treatment with antidiabetic agents on stroke outcomes in diabetic patients who suffer a stroke. We aimed to evaluate the effects of insulin versus oral hypoglycemic agents (OHAs) on stroke outcomes in patients with type 2 diabetes (T2D).

Methods : We conducted a descriptive-retrospective study of 191 stroke patients with past medical history of DM to compare the effect of Insulin and OHAs therapy on stroke outcomes. All patients were assessed with the modified Rankin Scale (mRS) test.

Results : The correlation between the type of DM treatment and patients' CT scan findings was statistically significant (Correlation coefficient=0.156) (p=0.031). The correlation between serum creatinine level and the type of DM treatment was statistically significant (Correlation coefficient=-0.715) (p<0.001). There was statistically significant correlation between the DM treatment duration and patients' gender but it was not clinically significant (Correlation coefficient=0.143) (p=0.049). The correlation between the DM treatment duration and serum creatinine level of patients was only statistically significant (Pearson correlation=0.279) (p<0.001).

Conclusion : stroke patients with type 2 diabetes who were treated with insulin had a lower modified Rankin Scale (mRS) score at discharge compared to those who were treated with oral hypoglycemic medications. This is the first retrospective study claimed that stroke patients with diabetes who were treated with insulin had better discharge outcomes and lower mRS score compared to OHAs therapy.

Keywords : stroke outcomes; insulin; oral hypoglycemic agent; type2 diabetes

11th Basic and Clinical Neuroscience Congress 2022
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Count: 343
Abstract ID: 134
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Short-term therapeutic potential of hair follicle-derived stem cell intranasal transplantation in a rat model of ischemic stroke

Submission Author: Seyedeh Maryam Mousavi

Seyedeh Maryam Mousavi[1], Sareh Pandamooz[2], Bijan Akbarpour[3], Afshin Borhani-Haghighi [4], Mohammad Saied Salehi[5]

1. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
2. Stem Cells Technology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
3. Department of Basic Sciences, Faculty of Veterinary Medicine, Kazerun Branch, Islamic Azad University, Kazerun, Iran
4. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
5. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Stem cell-based therapy has received considerable attention as a potential candidate in the treatment of ischemic stroke; however, employing an appropriate type of stem cells and an effective delivery route are still challenging. In the present study, we investigated the therapeutic effect of safe, noninvasive, and brain-targeted intranasal administration of hair follicle-derived stem cells (HFSCs) in a rat model of ischemic stroke.

Methods : Here, stem cells were obtained from the adult rat hair follicles. Stroke was induced by 30 min middle cerebral artery occlusion (MCAO) and stem cells were intranasally transplanted immediately after ischemia. Neurological performance, short-term spatial working memory and infarct volume were assessed 3 days after stem cell transplantation.

Results : MCAO resulted in remarkable neurological deficits and induced damages in ipsilateral hemisphere. Intranasal administration of HFSCs improved functional performance at day 3 after transplantation. Moreover, infarct volume reduced in the stem cell-transplanted animals compared to the MCAO group. Short-term spatial memory, however, was not affected neither by ischemia induction nor cell administration 3 days after the interventions.

Conclusion : These findings highlight the curative potential of HFSCs following intranasal transplantation in a rat model of ischemic stroke.

Keywords : MCAO; Cell therapy; HFSCs; Intranasal

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Count: 344
Abstract ID: 69
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Increased strength of the blood-brain barrier following modulating cation-chloride co-transporters expressions by up regulation of miR-149-5p in animal model of cerebral ischemia

Submission Author: Meysam Forouzandeh

Mehdi Eskandari[1], Hossein Mostafavi[2], Meysam Forouzandeh[3], Elham Ghasemloo[4], Narges Amoli[5], Masoumeh Hosseini[6]

1. Department of Physiology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran.
2. Department of Physiology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran.
3. Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
4. Department of Physiology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran.
5. Department of Physiology, School of Medicine, Zanjan University of Medical Science, Zanjan, Iran.
6. Laboratory Expert Deperment of Physiology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran.

Background and Aim : Brain ischemia leads to chloride gradient alternations which effects volume regulation and neuronal survival. The increase in NKCC1 expression and reduction in KCC2 level under ischemic condition results in inflammation and neuronal death. It was determined that mir-149-5p decreased after brain ischemia and this decrease is associated with increased inflammation and damage to the blood-brain barrier (BBB). Therefore, it seems that increasing the expression of this miR can be effective in increasing the strength of the BBB. Coenzyme Q10 is also an antioxidant compound that has anti-inflammatory and anti-apoptotic properties and plays a role in modulating the expression of miRs. Therefore In this study, we investigated the effect of mimic of miRNA-149−5p (mimic miR) and CoQ10 on the expression of cation-chloride co-transporters (NKCC1 and KCC2) after cerebral ischemia.

Methods : We modeled brain ischemia by Middle Cerebral Artery Occlusion (MCAO). 108 male Wistar rats were randomly divided into 6 groups: Sham (without surgery and treatment), Model (MCAO), Negative Control (MCAO+ Scramble miRNA), Vehicle (MCAO + Ethanole), First treatment: (MCAO + mimic miR), Second treatment: (MCAO + Q10). Each group was divided into 3 subgroups to assess the volume of tissue damage by staining with TTC and neurological deficits scores (NDS) in subgroup 1, brain water content in subgroup 2, level of miRNA149-5p and cation-chloride co-transporters expressions by qRT-PCR in subgroup 3.

Results : Our data suggests that the use of mimic miR and Q10 increased the level of miR-149 (P<0.001, P<0.01) and KCC2 (P<0.001, P<0.001) expression and decreased NDS (P<0.05, P<0.01), NKCC1 (P<0.001, P<0.001) expression, brain water content(P<0.01, P<0.01), cortex (P<0.01, P<0.001) and sub cortex (P<0.01, P<0.001) infract volume. In all the analyses, a significant difference was revealed between the mimic miR and Q10 receiving groups.

Conclusion : These findings suggest that the mimic of miRNA-149−5p and Q10 can have neuroprotective effects by reducing infract volume and brain water content and modulating expression of cation-chloride co-transporters after brain ischemia.

Keywords : miRNA149-5p; Coenzyme Q10; NKCC1 and KCC2; Brain Ischemia

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Count: 345
Abstract ID: 29
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Dual effects of lipopolysaccharide on ischemic stroke outcomes

Submission Author: Maryam Sardari

Maryam Sardari[1]

1. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran

Background and Aim : Despite considerable progress in acute stroke management, ischemic stroke remains the leading cause of long-term disability and second cause of death worldwide. Infections are risk factors predisposing for poor stroke outcome and via induction of sepsis are the major cause of stroke-associated deaths. Lipopolysaccharide (LPS), a major component of the outer membrane of gram-negative bacteria, activates pro-inflammatory signals through toll-like receptor-4 (TLR4), which in the brain is mainly expressed by microglial cells. LPS administration mimics the systemic infection and exhibits varying effects in different animal models. In rodent models of middle cerebral artery occlusion (MCAO), post-ischemic injections of LPS-induced inflammatory responses which were followed by long-lasting disturbances of endogenous neurogenesis, neuroplasticity, learning and memory performance that persist over at least one month. Notably, in mice that were exposed to 30-min MCAO, LPS increased the thrombus formation, adhesion molecules abundance in the ischemic micro vessels plus immune cells infiltration in ischemic animal. LPS also enhanced the microglia activation in the ischemic core and change the microglia phenotype to inflammatory ones. Thereby, systemic delivery of LPS at higher dose exacerbates the brain injury induced by ischemic stroke. On the other hand, previous studies have shown that the LPS delivery before ischemia conferred protection via inflammatory pre-conditioning in rats and mice. Additionally, post-ischemic intraperitoneal single injection of LPS induced transient hypothermia, reduced brain infarct volume and increased neuronal survival and the density of CD206+ microglial cells in ischemic hemisphere. It seems that lipopolysaccharide prevents neuronal damage by transforming the microglia into a neuroprotective phenotype and suppresses the cellular inflammatory response to ischemia in the brain and circulation. It has been suggested that systemic delivery of low-dose lipopolysaccharide may represent an innovative prevention or treatment for neurological diseases. The combined evidence of these studies suggests the timing and dosing of LPS decisively influence effects in the ischemic brain.

Keywords : Middle cerebral artery occlusion, Lipopolysaccharide, Microglial activation, Neuroprotection, Neuroinflammation

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Count: 346
Abstract ID: 39
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Comparison of the efficacy of shortened and original NIH stroke scale on the assessment of stroke patients

Submission Author: Sama Rahnemayan

Sama Rahnemayan[1], Samad Shams Vahdati[2], Alireza Ala[3], Elyar Sadeghi-Hokmabadi[4], Zahra Vand Rajab Pour[5], Ipak Entezari[6], Nasrin Taghizadieh[7]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Emergency medicine department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran
3. Emergency medicine department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran
4. Neurology department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran
5. Emergency medicine department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran
6. Emergency medicine department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran
7. Emergency medicine department, Emergency medicine research team, Tabriz University of medical sciences, Tabriz, Iran

Background and Aim : Rapid intervention in stroke plays an important role in improving the prognosis of patients and preventing subsequent disabilities. Therefore, it is important to introduce alternative diagnostic criteria with high performance speed; which are at the same time able to maintain the high diagnostic power of the primary criterion. In this study, the aim is to compare the performance of shortened NIH Stroke Scale/Score (NIHSS) with its original version.

Methods : In this cross-sectional prospective study, stroke patients who referred to the emergency department of a 7/24 stroke center were included. For each patient original NIHSS and shortened NIHSS scores were calculated both at the emergency settings and time of discharge. Also, patient outcome was calculated at the time of discharge based on the modified Rankin Score (mRS). The Pearson regression statistical method was used to check the relationships between initial and final NIHSS and mRS. The significant level of the number was set at $P < 0.05$.

Results : In this study 29 stroke patients were included (158 male and 134 female). Of these patients, 34 (11.6%) received level one, 120 (41.1%) level two, and 138 (47.3%) level three triage. The Pearson correlation (r) between shortened and original NIHSS in the initial emergency settings and the time of discharge were 0.970 and 0.806, respectively. Furthermore, both NIHSS scores at the emergency department had a close relationship with mRS at the time of discharge (r = 0.803 and 0.813 respectively); however, they were not correlated to patient outcome (r = 0.580 and 0.582 respectively).

Conclusion : The results of this study shows that shortened NIHSS can be a good alternative to original NIHSS in emergency settings, which is both easy and time-consuming to calculate, and at the same time maintains the diagnostic sensitivity of the original version and decision making on fibrinolytic treatment.

Keywords : NIH stroke scale; Stroke; Outcome

Count: 347
Abstract ID: 441
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

A comparative study on the role of left and right hemisphere damage on the semantic control

Submission Author: Negin BorjianBoroujeni

Negin BorjianBoroujeni[1], Farbia Yadegari[2], Mehdi Alizadeh Zarei[3]

1. Department of Social Cognition, Institute for Cognitive Science Studies, Tehran, Iran
2. Department of Speech Therapy, School of Rehabilitation, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
3. Department of Occupational Therapy, School of Rehabilitation, Iran university of medical science, Tehran, Iran.

Background and Aim : Semantic control is the ability of the semantic system to select correctly the target concept, from among competing representations. The deficit in semantic control usually were seen in stroke-related lesions. In these participants semantic representation remain intact, however, the deficit in semantic-lexical connections led to the inability to access semantic-representations. Although detailed studies exist of the roles of several cortical regions such as inferior frontal gyrus (IFG), middle temporal gyrus (MTG) and angular gyrus (AG) in semantic control. However most of them have almost exclusively focused on the left hemisphere damage. Rarely studied, right hemisphere may also be involved in semantic processing. We here conducted a comparative study on verbal and non-verbal semantic tasks to investigate consequence effects of the left and right hemisphere damage on the semantic control.

Methods : A total of 52 subjects including 13 participants with right hemisphere stroke (Mean age =53.62, 6 female), 13 participants with left hemisphere stroke (Mean age = 53.62, 5 female), and 26 healthy subjects (Mean age= 54.19, 11 female), take part in a cross-sectional comparative study. The Pyramids and Palm Trees Test (PPTT), Concrete and Abstract Words Synonym Test (CAWST), and Bilingual Aphasia Test (BAT) were used for comparison of the semantic control abilities

Results : A significant between-group difference was observed for the word version of the PPTT $(F_{(2-1)} = 8.85$, p-value = .02). There was no significant between-group difference on the pictorial version of the PPTT $(F = .87$, p-value = .42). On the CAWST, significant between-group differences were observed for both synonymy in concrete words $(df_{(2-1)} = 12.35$, p-value = .0001)

and synonymy in abstract words (df (2-1)= 5.02, p-value = .01). Given that BAT subtests are not normal in terms of data distribution, the Kruskal–Wallis nonparametric test was used to compare each of these subtests among the three groups. A significant between-group difference was observed for four subtests out of the six subtests synonyms ($p < 0.05$), antonyms ($p \leq 0.05$), homogeneous antonyms ($p \leq 0.05$), non-homogeneous antonyms ($p < 0.05$), and acceptability of meaning ($p < 0.05$). Pair-wise comparison among three groups of subjects showed that participants with left hemisphere injury had significantly lower performance than normal subjects ($p < 0.05$), and also had significantly lower performance rather than right hemisphere participants (df (2-1) = 51.11, $p < 0.05$). On the other side, participants with right hemisphere damage have significantly lower performance rather than normal subjects ($p < 0.05$).

Conclusion : Based on the impaired concrete and abstract word processing in participants with left hemisphere damage, it seems that semantic control mostly relies on the left hemisphere. Moreover, based on the difficulty in understanding abstract words in participants with right hemisphere damage, we can conclude that the right hemisphere has a complementary role in semantic control.

Keywords : semantic processing,semantic control,stroke,right hemisphere,left hemisphere

Count: 348
Abstract ID: 477
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The effects of Satureja.rechingeri essential oil on ischemic damages induced by transient stroke in animal model

Submission Author: Zahra Sadeghian

Zahra Sadeghian[1], dr mohammadreza bigdeli[2]

1. master student neuorophysiology
2. faculty member of biology of shahidbeheshti university

Background and Aim : Background: Ischemic stroke is the third cause of death worldwide and Iran is 2rd in this ranking. The World Health Organization has reported that an average of 15 million people suffer from stroke every year. Notably, the most common cause of stroke is cerebral ischemia, which is caused by occlusion of cerebral arteries. Stroke as a pathophysiological phenomenon in the central nervous system leads to neural death. Oxidative stress is a harmful injury in cerebral ischemia that results in an imbalance of free radicals and endogenous antioxidants. In this study, it was attempted to investigate the effects of Satureja.rechingeri essential oil on ischemic damages in animal model of stroke.

Methods : Material & method: In this study, Satureja.rechingeri plant was collected from Ilam regions and its volatile essential oil was prepared. Then, its antioxidant contents were measured using GC-MS. In this study, 50 male wistar rats were divided into 3 groups: sham, control, and Satureja.rechingeri essential oil. The sham-operated animals underwent the same surgery procedure of middle cerebral artery occlusion (MCAO) without introducing a filament. Control group was subjected to 60 min of MCAO surgery without receiving any treatment. Treatment group received 15 µl of Satureja.rechingeri essential oil subcutaneously 2 h before MCAO surgery. 24 h after reperfusion, neurological deficits, infarcted volume, cerebral edema, and blood brain barrier integrity were evaluated.

Results : Result: For the first time, the results showed that This plant native to Iran has many chemical compounds that have been determined with the help of GC-MS. This species contains trypenoids. Also, administration of a dose of 15 µl of Satureja.rechingeri essential oil remarkably improved the neurological deficits. In addition, this essential oil reduced infarction volume and cerebral edema significantly ($P<0.03$, $P=003$, respectively). It should be stated that Satureja.rechingeri essential oil attenuated blood-brain-barrier breakdown.

Conclusion : Conclusion: According to achieved results, it can be assumed that the neuroprotective effects of Satureja.rechingeri essential oil in cerebral ischemia is exerted due to high antioxidant contents of this plant.

Keywords : Keywords: Ischemic stroke, Satureja.rechingeri essential oil, Infarction, Edema, Blood brain barrier.

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Count: 349
Abstract ID: 427
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Effect curcumin and dextran-curcumin against oxidative stress induced by model of global brain ischemia

Submission Author: Homa Talebi

Homa Talebi[1]

1. 1. Department of Biology, Faculty of Basic Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran

Background and Aim : Ischemia is a neurodegenerative disease in which the death of neurological cells caused by pathophysiological events such as oxidative stress and inflammatory event. Inflammation plays an important role in the pathogenesis of ischemic stroke and other forms of brain damage. Polyphenolic curcumin has antioxidant, anti-inflammatory and anti-apoptotic properties. Low water solubility and instability of curcumin decreased its bioavailability and is considered as a major barrier to its clinical applications. The purpose of this study was to measure the protective effect of curcumin and conjugate dextran-curcumin on inflammation of ischemia in an animal model of stroke.

Methods : In this study, 55 rats were divided into 5 groups: control, received distilled water; positive control, received curcumin (15 mg/kg orally); ischemic and ischemic pretreated curcumin and conjugate of dextran-curcumin for 28 days. For induction of the ischemic stroke model, the carotid arteries were closed by two 5-minute steps

Results : . The results of this study showed that conjugate Dextran-Curcumin pretreatment compare with the ischemic group significantly catalase, superoxide dismutase activity ($p < 0.001$).

Conclusion : the antioxidant capacity promoted by dextran-curcumin was closely related to antioxidan and anti inflammatory properties

Keywords : ischemia stroke, dextrean-curcumin, stress oxidative, inflammation

Count: 350
Abstract ID: 440
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The effect of movement training using virtual reality technology on the working memory of athletes with a history of stroke

Submission Author: Nasrin Ghasarehzadeh

Aida Sepiddami[1], Fereshteh Amouzadeh[2], Nasrin Ghasarehzadeh[3], Rana Faraji[4], Mostafa Amouzadeh[5]

1. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
2. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
3. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
4. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
5. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran

Background and Aim : A stroke, happens when parts of the brain are damaged or die. A stroke can cause permanent brain damage, long-term disability, and it is associated with damages such as defects in working memory or even death. The incidence of stroke in sports is unknown, and the risk of injury to neurovascular structures may depend on the type of sport involved, and cervicocerebral artery dissection is often recognized as a major cause of stroke in young athletes. The aim of this study was to investigate the effect of movement training using virtual reality technology on the working memory of athletes with a history of stroke.

Methods : 30 elderly athletes 25-30 years old with an average age (31.12 ± 1.83 years) voluntarily participated in the present study and were randomly divided into two movement training and control groups (n=15). The motor training group performed the training intervention for 8 weeks and 3 sessions per week, each session lasting 45 minutes. The control group did not receive any intervention. Working memory was evaluated using the N-BACK- (working memory test) in pre-test, post-test, and follow-up. Statistical analysis was performed using SPSS version 22 software ($p<0.05$

Results : The results of the analysis of variance with repeated measures indicated a significant improvement in working memory ($p=0.011$) in the movement training group compared to the control and the stability of the results two weeks after the post-test.

Conclusion : According to the obtained results, 8 weeks of motor training using virtual reality technology has a positive and significant effect on the working memory of athletes with a history of stroke. Therefore, it is suggested to use this method to improve the working memory of Athletes with a history of stroke.

Keywords : Virtual reality technology, Athletes, working memory, stroke.

Count: 351
Abstract ID: 494
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Therapeutic effects of blood-derived products in ischemic stroke: A systematic review

Submission Author: SAREH KAZMI

SAREH KAZMI[1], Saeed Sadigh-Eteghad[2], Hanieh Salehi-Pourmehr[3], Mehdi Farhoudi[4]

1. 1.Neuroscience Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.2. Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Neuroscience Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Research Center for Evidence-Based Medicine, Iranian EBM Centre: A Joanna Briggs Institute (JBI) Center of Excellence, Tabriz University of Medical Sciences, Tabriz, Iran
4. Neuroscience Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Ischemia is a complex vascular pathology that lead to morbidity and mortality with increasing prevalence all over the world. Excitotoxicity and inflammation are the most threatening mechanisms that affects outcomes of ischemia treatments. Blood-derived products possible by inhibition of this mechanism may result in favorable improvements post-ischemia.

Methods : In this study we conducted systematically search for "Blood-derived products" and "Ischemia" in PubMed, Web of science, Scopus database, Cochrane library and Google Scholar from the inception to November 2022. The results were screened by two reviewers independently.

Results : Of the 5,444 records found in initial search, papers on Anakinra and Albumin as a treatment in ischemia had the most articles on pre-clinical in vivo studies as well as clinical trials. 68% of these articles have been published in animal studies with remarkable efficacy in rodent ischemic models. Improving in physical and mental conditions in clinical studies, and volume of infarction, neurobehavioral scores, molecular indices were reported in most of animal studies.

Conclusion : This findings proposes the blood-derived products as a complementary approach in treatment of ischemic stroke.

Keywords : Ischemia/Blood Products/Pre-Clinical Study/Systematic Review

Count: 352
Abstract ID: 230
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

A Possible Role of Ferooptosis in Neonatal Hypoxic Ischemic Encephalopaty

Submission Author: Neda Yazdanfar

Neda Yazdanfar[1]

1. Neurosciences Research Center, Tabriz University of Medical Sciences

Background and Aim : Ferroptosis is a type of programmed cell death caused by phospholipid peroxidation that has been implicated as a mechanism in several diseases resulting from ischemic-reperfusion injury. Ferroptosis has been identified as a possible key injury mechanism in neonatal hypoxic-ischemic brain injury (HIBI). Despite the known involvement of ferroptosis in these conditions, the endogenous mechanisms remain poorly understood

Methods : Many of the ferroptosis pathways have been demonstrated to be altered after neonatal HIBI. The neonatal HIBI is a triphasic injury. The first phase initiates with the hypoxic-ischemic insult, the primary energy failure and hypoperfusion resulting in necrotic cell death in the minutes to hours after the restoration of normoxia and adequate perfusion. The secondary phase starts between 6 and 12 h after injury and continues until about 72 h after injury. It is characterized by deteriorating mitochondrial function and an acute inflammatory response, with apoptosis being the hallmark cell death process during this phase, though this is also the timing where ferroptotic changes have been observed (24–72 h). The tertiary phase, which includes partial recovery and continued inflammation and gliosis.

Results : There are multiple ferroptosis pathways, many of which revolve around iron, acyl-CoA, and glutathione (GSH) metabolism (particularly GSH synthesis and the activity of GPX4).The cysteine-GSH-GPX4 system plays a central role in the cellular antioxidant mechanism and ferroptosis prevention. Inhibition of the Xcsystem by erastin deprives the cells of cysteine, thus depriving them of GSH, triggering ferroptosis. Inhibition of GPX4 by RSL3 deprives the cells from the enzyme that reduces phospholipid peroxides (LOOH) to their corresponding alcohols (LOH), increasing lipid peroxidation and associated ferroptosis. The enzyme acyl-CoA synthetase long-chain family member 4 (ACSL4) activates highly oxidizable PUFAs, which is a critical step in their incorporation into phospholipids and into the cell membrane. Depleting the cells of ACSL4 increases the cellular resistance to ferroptosis.

Conclusion : Many of the ferroptosis to be altered after neonatal HIBI. However, our understanding of ferroptosis is still at an early stage, and no specific biomarkers have been found for the identification of ferroptosis in vivo.

Keywords : Ferroptosis, Neonatal Hypoxic Ischemic, Oxidative Stress

Count: 353
Abstract ID: 218
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Key role of compression in neuropathy after surgery

Submission Author: Abolfazl BarzegarBafrouei

Abolfazl BarzegarBafrouei[1], Moosa Javdani[2]

1. Department of clinical sciences, Faculty of veterinary medicine, Theriogenology section, Shahid Chamran university, Ahvaz, Iran
2. Department of clinical sciences, Faculty of veterinary medicine, Surgery section, Shahrekord university, Shahrekord, Iran.

Background and Aim : Positioning-related obstacles normally are thought to be associated with an inapplicable comprehension of the anatomic constructions of impacted tissues and nerves. Tissue stretch and compression are commonly considered to be associated with positioning-related problems in anesthetized or sedated patients.

Methods : The present study reviewed studies on the effect of Key role of compression in neuropathy after surgery. The review article is written according to the keywords "Nerve tissues, Compression, Axonotmesis".

Results : Direct pressure on soft and nerve tissues may reduce local blood flow and disrupt cellular integrity, resulting in tissue edema, ischemia, and, if prolonged, necrosis. Neurologists and other physicians have considered nerve compression damage to exist as one of three types: neurapraxia, axonotmesis, and neurotmesis. Neurapraxia is a transient peripheral nerve dysfunction that may result from short, temporary ischemic episodes. If local ischemia becomes prolonged, focal demyelination will occur. To prevent direct nerve compression in anesthetized or sedated patients, anesthesia providers, and surgical teams often use a variety of padding types of disperse point pressure on peripheral nerves. More significant nerve injury occurs with axonotmesis. Peripheral nerves contain bundles of axons surrounded by Schwann cells that either tightly wrap individual axons in the case of myelinated axons or more loosely surround the unmyelinated axons. If the ischemia is severe enough, significant axonal damage occurs with the axon primarily degenerating distally from the injured site. While remyelination can happen rapidly (usually within days), axonal regeneration from the site of injury to its distal target (muscle, skin) is much slower (approximately 1 mm/ day) and is often incomplete.

Conclusion : Extended immobilization of impacted tissues leads to development of inflammation and interstitial edema. These 2 factors exasperate compression and stretch forces and, over a sufficient period of time, may cause ischemia and more significant tissue damage. The loss of ability of anesthetized or sedated patients to respond to painful stimuli by moving is a major factor in perioperative position problems and is why all anesthesia providers are taught basic position issues in their training. Neurotmesis involves disruption of the axon, Schwann cells, and surrounding connective tissue architecture. With neurotmesis, the axons are unable to regenerate distal to the site of injury and permanent injury occurs without surgical intervention. It results when nerves have been surgical cut or otherwise disrupted by traumatic forces (e.g., direct needle trauma from invasive procedures). While compression may contribute to this severe nerve injury, it is usually not the only force.

Keywords : Nerve tissues, Compression, Axonotmesis

Count: 354
Abstract ID: 219
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The effect of stretching on the relationship between surgery and nerve tissue damages

Submission Author: Abolfazl BarzegarBafrouei

Abolfazl BarzegarBafrouei[1], Moosa Javdani[2]

1. Department of clinical sciences, Faculty of veterinary medicine, Theriogenology section, Shahid Chamran university, Ahvaz, Iran
2. Department of clinical sciences, Faculty of veterinary medicine, Surgery section, Shahrekord university, Shahrekord, Iran.

Background and Aim : Positioning sedated or anesthetized patients for diagnostic and surgical procedures is a potentially under-thanked clinical practice that can effective patient and surgical results. In some cases, these positioning-related obstacles may in destructing outcomes such as central nervous system disruption (e.g., tetraplegia) or complete vision loss. In specific, 2 types of complications in these patients, soft tissue and peripheral nerve injuries. Two mechanical factors, stretch and compression, are considered the maximum eventuality reasons of tissue damage.

Methods : The present study reviewed studies on the effect of stretching on the relationship between surgery and nerve tissue damages. The review article is written according to the keywords "Surgery, Nerve injuries, Stretch".

Results : Accordingly, surgical teams and anesthesia providers alike need to know the impact of these mechanical forces on nervous and soft tissues along with factors that may lead to their stretch or compression. A lot of us develop mild symptoms of soft tissue damage or perioperative neuropathy when sleeping normally. Usually, we may awaken from sleep with tingling in an ulnar nerve distribution. Sedated or anesthetized patients typically have their sensorium enough blunted by drugs to hinder them from moving or awaking nerves are typically well vascularized by short nutrient arteries that divide and anastomose upon and with them. In peripheral nerves, these minute arteries profusely anastomose to form an unbroken intraneural net, the vasa nervosum. This net rarely leaves any particular segment of a peripheral nerve dependent on a single vessel for nutrient support. This net is not seen as commonly in central nerve tissue. Stretch of nerve tissue, especially to more than 5% of resting length in the periphery, may kink or reduce the lumens of feeding arterioles and draining venules. This phenomenon can lead to direct ischemia from reduced

arteriole blood flow; indirect ischemia from venous congestion, increased intraneural pressure, and the need for high driving pressures of arteriolar blood flow; or bot. The lack of extensive vascular nets in central nervous tissue suggests that less stretch may be tolerated. Soft tissues (e.g., fat) generally are less susceptible to stretch injury than nervous tissue. They are often more compliant and elastic, and many peripheral soft issues do not need the same level of blood flow as nervous tissue.

Conclusion : Nonetheless, prolonged stretch of any soft tissue may result in ischemia and tissue injury. Unique perioperative patient positions may increase the risk of soft tissue stretch. Prolonged periods of ischemia may cause transient or permanent nerve injury.

Keywords : Surgery, Nerve injuries, Stretch

Count: 355
Abstract ID: 259
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Incidence of cervical arteries stenosis and the risk factors in ischemic stroke and transient ischemic attack in Urmia

Submission Author: Mehdi Mohebalizadeh

Mehdi Mohebalizadeh[1], Arash Moosarezayi[2]

1. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN
2. Neurology Department, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, IRAN

Background and Aim : Cerebrovascular accident is generally caused by a disturbance in the blood supply to an area of the brain, resulting in this part of the brain's inability to function normally. A stroke can be caused by the obstruction or rupture of one of the arteries supplying blood to the brain, called an ischemic stroke and hemorrhagic stroke. The internal and external carotid arteries deliver oxygen-rich blood to the brain, scalp, and face. Carotid artery obstruction is a severe condition because a stroke occurs when blood flow stops. Ischemic stroke is the most common neurological disorder that leads to disability or even death in adults and is the third cause of death after heart problems and cancers. Ischemic stroke is responsible for 85% of all strokes. Despite the new advances in diagnosing and treating this disease, stroke is still one of the most important causes of hospitalization and long-term disability.

Methods : After receiving the ethics code, the data were collected according to the Doppler ultrasound results of the cervical vessels, stenosis in the internal carotid and vertebral arteries were checked, and the percentage stenosis and their relationship with the risk factors in the history and paraclinical findings were extracted. Inclusion criteria: Patients with ischemic stroke and transient ischemic attack over 18 years old Exclusion criteria: -finding a cause other than cervical artery stenoses, such as the cardiac origin of ischemic stroke or transient ischemic attack -The incompleteness of patients' files -Hemorrhagic stroke -Patients with vasculitis Quantitative data were described as mean and standard deviation, and qualitative data was expressed as frequency and percentage. The relationship and correlation of the data were also evaluated with Pearson and Spearman coefficients and the chi-square test.

Results : One hundred eighty-six patients, 134 (72%) of CVA and 52 (28%) of TIA, were included. The death rate was 9.7%. Mortality was significantly higher in people with ischemic CVA than in TIA (P=0.002). No significant difference was observed between TIA and CVA

patients regarding gender frequency distribution (P=0.47). Eighty-nine patients had stenosis in at least one left or right internal carotid artery. There was no significant difference between CVA and TIA patients regarding the average percentage of vessel stenosis and frequency. Carotid artery stenosis was significantly higher in patients with dyslipidemia (P=0.01) and hypertension (P=0.03). However, there was no statistically significant relationship between the history of IHD and carotid artery stenosis (P=0.15).

Conclusion : Aging and the growth of the population led to a rise in the absolute number of strokes, especially among the elderly, and it is expected to increase dramatically in the coming years. According to the present study, hypertension and dyslipidemia were the significant risk factors for stroke in Urmia. Establishing a stroke registry (population- or hospital-based) for the province is recommended.

Keywords : Cerebral vascular accident; Transient ischemic attack; Ischemic stroke; Hemorrhagic stroke

Count: 356
Abstract ID: 334
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Effect of intracerebral hemorrhage on anxiety and depression-like behavior and amygdala glia changes and cell death

Submission Author: Farzaneh Vafaee

Farzaneh Vafaee[1], Mona Riyahi Rad[2], Shima Shirzad[3], Atiyeh Ghorbani[4]

1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
3. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
4. Department of Physiology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Intracerebral hemorrhage (ICH) is a cerebrovascular disease with a high mortality and morbidity rate. Studies show that more than two-thirds of people with a stroke undergo some degree of depression and anxiety. However, so far we have not found any study on the relationship between amygdala and striatum and changes in neurons and glial after stroke, and the present study examines these changes, which can be a vital path in finding effective treatments.

Methods : In this research, 48 male Wistar rats are used, which are divided into 6 groups. Three sham groups (sham-7, sham-14 and sham-21) in which ICH induction surgery was performed but no blood was injected and three ICH groups (ICH-7, ICH-14 and ICH-21) in which ICH induction surgery was induced by injecting 100 microliters of autologous blood into the left striatum. Anxiety and depression behaviors are measured by forced swimming test (FST), open field (OF) and elevated maze tests (EMT) on the 7th, 14th and 21st days after surgery, then the neuronal density was checked by stereology technique and the changes of astrocytes by immunohistochemical method.

Results : The results of this study show that the immobility time in the FST on the 21st day after ICH induction was significantly increased compared to the sham-21 group, also the active time in the ICH-21 group decreased compared to the sham-21 group. The time spent in the closed arm in the EMT in the ICH-14 and ICH-21 groups had a significant upward trend compared to the sham-14 and sham-21 groups. Central crossing in the OF test in the ICH-21 group had a significant decrease compared to the sham-21 group. Neuronal density in the amygdala area did not show any significant difference between the groups. GFAP positive cells in the ICH-7 and ICH-21 groups were increased in the ipsilateral amygdala compared to the sham-7 and sham-21 groups; moreover,

the same parameter was seen in the contralateral amygdala only in the ICH-2 group compared to the sham-21 group.

Conclusion : Based on the results, it can be concluded that 21 days after the creation of unilateral ICH in the striatum, anxiety and depression behaviors occur, which may be due to affecting the pathways of the striatum to the amygdala.

Keywords : Intracerebral hemorrhage, Depression and Anxiety, Astrocytes, Amygdala

Long non coding RNAs as potential biomarkers and thrapeutic targets in multiple sclerosis

Submission Author: Anahita Hashempour

Anahita Hashempour [1], Anahita Hashempoor[2], Mohammad-Reza Mahmoudian-Sani[3], Reza Khedri[4]

1. -
2. Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
3. Thalassemia & Hemoglobinopathy Research Center Ahvaz Jundishapur University Medical Sciences, Ahvaz, Iran
4. Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic autoimmune inflammatory neurological disease of the central nervous system (CNS). MS pathogenesis is associated with disturbances in coding and non-codingregulatory genes in the immune system. Both innate and adaptive immune mediated inflammatory mechanisms contribute to the demyelination and neurodegeneration in MS. the immune cells such as CD4 T-helper cells are the main contributors in disease pathogenesis. The presence of these cells in the CNS is associated with neuronal demyelination, subsequently result in neuroinflammation and neurodegeneration. long non-coding RNAs (lncRNAs) are long molecules in cells that take part in the regulation of gene expression. Several studies have confirmed the role of lncRNAs in neurodegenerative diseases such as MS. lncRNAs are key regulators of genes involved in the cell proliferation, differentiation, apoptosis and development, especially the immune cell differentiation and activation. dysregulated lncRNAs play key roles in the pathogenesis of inflammatory and autoimmune diseases. Although the mechanism for the vast majority of lncRNAs still remains unclear there is growing evidence that lncRNAs interfere with the pathogenic process of MS. In this review we aim to highlight the role of lncRNAs in the pathogenesis of MS and their potential role as a diagnostic marker and theraputic target for the disease

Methods : We conducted our search in PubMed, SCOPUS, Science direct, EBSCO, ProQuest for published literature until September, 2022 by keywords including Multiple sclerosis, long non coding RNA and biomarker. The extracted papers were studied. based on inclusion criteria we selected 10 articles from all obtained studies in the current study.

Results : Studies show The Role of LncRNAs in the Pathophysiology of MS through Participating in Adaptive Immune Response, Inflammation, Innate Immune Response, Regulation of the Cell Cycle and Response to DNA Damage Linc-MAF-4 and lnc-DDIT4 are two upregulated lncRNAs in MS which are involved in the regulation of immune responses and inflammation. DDIT4 is upregulated during DNA damage. Also, it inhibits the mTORC1 pathway which is a crucial regulator of the immune response. Linc-MAF-4 has an important role in regulating the differentiation of Th1/2 cells. TNF and HNRNPL-related immunoregulatory long non coding RNA (THRIL) regulates the innate immune system through regulation of TNF-a expression and is dysregulated in MS. Lnc-Dc plays its role in the immune response by affecting differentiation of dendritic cells. It has been recognized that lncRNAs may severe as therapeutic targets and diagnostic markers in MS. the expression patterns of lncRNAs are highly cell-type specific which makes them good candidates for disease diagnostics and classification. lncRNAs can easily be identified in various biological fluids. As therapeutic targets, lncRNAs also have certain advantages and could be used as targets to develop drugs.

Conclusion : In conclusion, the pathogenesis of MS is highly complex including several molecular signaling pathways. Studies have highlighted the function of various lncRNAs in the MS pathophisiology. Identifying the roles of lncRNAs in MS may be the key to clarify the mechanisms that contribute to the development of this disease which can lead to new biomarker and thraputic target discovery.

Keywords : Multiple Sclerosis, Long non coding RNA, Biomarker

Count: 358
Abstract ID: 256
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Investigation of the effect of Fibronectin on the viability and adhesion of mouse fibroblast cells on the rat decellularized sciatic nerve scaffold in-vitro

Submission Author: Hananeh Ahmadnia

Hananeh Ahmadnia[1], Morteza Behnam-Rasouli[2], Muthana Sarem Hamzah Alftle[3], Mona Taghizade Salari[4]

1. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
2. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
3. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
4. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

Background and Aim : Traumatic injury often causes peripheral nerve lesions. These lesions can lead to the loss of sensation and motor function and decrease the quality of life. After a serious injury that destroys part of the nerve tissue, the recovery process needs proper treatment. Therefore, researchers in the field of engineering are trying to replace the lost nerve tissue using biological scaffolds and stem cells. It seems that the combination of scaffolds obtained from decellularization of peripheral nerves and mouse fibroblast cells is a suitable alternative for nerve xenograft to replace lost peripheral nerves. In the present study, decellularized scaffolds were prepared from the sciatic nerve of male Wistar rats, and the amount of viability and adhesion of mouse fibroblasts on these scaffolds were investigated in the presence of fibronectin.

Methods : In this research, samples were taken from the sciatic nerve of rats and, after decellularization by Sandel's method, they were tested. Control group: mouse fibroblast cell + culture medium, experimental groups 1, 2, 3, 4 and 5: mouse fibroblast cell + culture medium + concentrations of 2.5, 5, 10, 20, and 40 ng/ml fibronectin, experimental group 6: mouse fibroblast cell + culture medium + decellularized scaffold of the sciatic nerve of male Wistar rats and experimental groups 7, 8, 9, 10 and 11: mouse fibroblast cell + culture medium + decellularized scaffold of the sciatic nerve of male Wistar rats + concentrations of 2.5, 5, 10, 20, and 40 ng/ml of fibronectin.

Results : Addition of fibronectin in concentrations of 2.5, 5, 10, 20, 40 ng/ml and in two time periods of 72 and 144 hours not only did not have a positive effect on the increase in viability of fibroblasts but also led to a significant decrease in the amount of their viability in some groups

(p<0.001). On the other hand, fibronectin did not have a positive effect on cell adhesion to the decellularized scaffold of the sciatic nerve of male Wistar rats.

Conclusion : The findings of this research showed that the addition of fibronectin to the culture medium of mouse fibroblast cells cannot increase the viability of the cells, and the addition of decellularized scaffold of the sciatic nerve of male Wistar rats into the culture medium of mouse fibroblast cells also does not affect the amount of viability and adhesion of cells. The possibility, however weak, that interspecies differences may play a role in this should not be overlooked.

Keywords : Sciatic Nerve; Decellularized Scaffold; Fibroblast; Fibronectin; Viability; Adhesion

Count: 359
Abstract ID: 257
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Investigation of the effect of valproic acid on the viability and adhesion of mouse fibroblast cells on the rat decellularized sciatic nerve scaffold in-vitro

Submission Author: Mona Taghizade Salari

Mona Taghizade Salari[1], Morteza Behnam-Rasouli[2], Waleed Flayyih Hatem Albusalih[3], Hananeh Ahmadnia[4]

1. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
2. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
3. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
4. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

Background and Aim : Peripheral nerve damage is one of the common disorders, and its repair is considered a major challenge in medicine. In this regard, tissue engineering researchers are trying to replace lost natural tissues using biological scaffolds. It seems that the combination of scaffolds obtained from decellularization of peripheral nerves and fibroblasts is a suitable alternative for nerve autografts to replace lost peripheral nerves. In the present study, decellularized scaffolds were prepared from the sciatic nerve of rats, and the amount of viability and adhesion of rat fibroblasts were investigated in the presence of valproic acid.

Methods : In this research, rats' sciatic nerves were sampled and tested after decellularization using Sandel's method. Control group: Rat fibroblast cell + culture medium, Negative control group: Rat fibroblast cell + culture medium + DMSO, Experimental group 1, 2, 3 and 4: Rat fibroblast cell + culture medium + concentrations of 0.625, 1.25, 2.5 and 5 μM valproic acid, Experimental group 5: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold, Experimental group 6: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold + DMSO and Experimental group 7, 8, 9 and 10: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold + concentrations of 0.625, 1.25, 2.5 and 5 μM valproic acid.

Results : valproic acid in the treatment groups with concentrations of 0.625, 1.25, 2.5 and 5 ?M not only did not have positive effect on the survival, viability and adhesion of cells, but also caused a significant decrease in the amount of viability and adhesion of cells.

Conclusion : The findings of this research show that not only adding valproic acid to the culture medium has no effect on the amount of viability and adhesion of cells, but also adding scaffolds to the culture medium in the presence and absence of valproic acid has negative effects on the amount of viability and adhesion of rat fibroblasts.

Keywords : Sciatic nerve; Decellularized scaffold; Fibroblast; Valproic acid; Viability; Adhesion.

Count: 360
Abstract ID: 164
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Lithium Loaded Electrospun Nanofibrous Scaffolds Ameliorate Schwann Differentiation, Nerve Regeneration and Functional Recovery in a Rat Sciatic Nerve Crush Injury Model

Submission Author: Banafsheh Dolatyar

Bahman Zeynali[1], Banafsheh Dolatyar[2], Iman Shabani[3], Azita Parvaneh Tafreshi[4], Reza Karimi-Soflou[5]

1. Department of Cell and Developmental Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
2. Department of Cell and Developmental Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Department of Biomedical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran
4. Department of Molecular Medicine, Faculty of Medical Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
5. Department of Biomedical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran

Background and Aim : There are increasing reports demonstrating that the tissue engineered nerve grafts are promising and attractive substitutes to natural autografts for regeneration of peripheral nerve injuries (PNI). However, most of these reports have focused on the topographical features of the grafts, and the fabrication of scaffolds that provide both biophysical and biochemical signals has received less attention.

Methods : In this study, we fabricated an electrospun nanofibrous scaffold (ENS) containing polylactide nanofibers and lithium ion (Li) as a Wnt/β-catenin signaling activator. The chemical and topographical properties of our scaffolds could ameliorate Schwann-like differentiation efficiency and consequently nerve regeneration of the PNI animal models.

Results : Our results showed that the Li loaded ENSs gradually released Li during 11 days of culture, with the range concentration (0.02 to 3.64±0.1 mM) that upregulate the expression of Wnt/?-catenin target genes (cyclinD1 and c-Myc). Moreover, the expression levels of Schwann cell markers (S100B, GAP43, GFAP and SOX10) in human adipose-derived mesenchymal stem cells (hADMSCs) cultured on this scaffolds, were notably increased compared to those in the control (scaffold without Li). Our in vivo assay showed that implantation of Li loaded ENSs in the

rat model of crush injury promotes behavioral features including recovery of sensory, motor and sensory-motor function of injured sciatic nerve. Electrophysiological analysis demonstrated that compound muscle action potential and nerve conduction velocity were significantly increased, while terminal latency was significantly decreased in the animals implanted with Li loaded ENSs compared to the scaffolds without Li. Histological analysis revealed no fibrous connective tissue in the regenerated nerve fibers, instead axonal density and myelination were significantly increased in a more organized manner.

Conclusion : Together, our results suggest that Li loaded ENSs could provide appropriate conditions for differentiation of hADMSCs into Schwann cell-like cells and improvement of axonal regeneration and myelination, introducing them as a promising scaffold in nerve tissue engineering applications.

Keywords : stem cell; Schwann cell differentiation; electrospun nanofibrous scaffold; lithium ion; nerve regeneration

Count: 361
Abstract ID: 201
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Ablation of Astrocyte Improve Remyelination in the Cuprizone-induced Murine Model

Submission Author: Soheila Madadi

Soheila Madadi[1], Shokoofeh Kazemzadeh [2]

1. Department of Anatomy, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran
2. Department of Anatomy, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Multiple Sclerosis (MS) is a chronic inflammatory demyelination disorder in the central nervous system (CNS), which often affects young adults. In MS damage, astrocytes display an active, dual and controversial role in the progression of the disease. Regarding the dichotomy of role of astrocytes in demyelinating insult, in present study we aimed to evaluate possible roles for pharmacologic astrocyte ablation strategy using La-aminoadipate (L-AAA) on remyelination in a cuprizone model of demyelination.

Methods : Male 8-week-old C57BL/6 mice weighing 20-25 g, were fed with 0.2% cuprizone for 12 weeks followed by 2-week administration of L-AAA through a cannula inserted 1 mm above the corpus callosum. Two weeks after L-AAA administration, 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 ttechnique. Finally, data was analyzed by SPSS software and ANOVA test.

Results : Rotarod test showed a significant decrease in the range of motor coordination deficits after ablation of astrocytes in mice receiving cuprizone. Results of Luxol fast blue (LFB) and transmission electron microscopy (TEM) for evaluation of the myelin content within the corpus callosum revealed a noticeable rise in the percentage of myelinated areas and in the number of myelinated fibers after L-AAA administration to such animals. Astrocyte ablation reduced protein expressions for GFAP (an astrocyte marker) and Iba-1 (a microglial marker), but increased expression of Olig2 (an oligodendrocyte marker) assessed by immunofluorescence.

Conclusion : These results are indicative of improved remyelination after ablation of astrocytes possibly due to hampering microgliosis and astrogliosis and a further rise in the number of matured Olig2^{+} cells.

Keywords : astrocyte ablation, cuprizone, La-aminoadipate (L-AAA), multiple sclerosis (MS), remyelination, corpus callosum

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

The positive effects of controlled release of brain-derived neurotrophic factor and gold nanoparticles in laminin coated in electrospun PLGA scaffold for nerve tissue engineering

Submission Author: Reihaneh Seyedebrahimi

Reihaneh Seyedebrahimi[1], Shahnaz Razavi[2], Jaleh Varshosaz[3], Elham Vatankhah[4], Mohammad Kazemi[5]

1. Department of Anatomy, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran
2. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
3. Department of Pharmaceutics, School of Pharmacy and Novel Drug Delivery Systems Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
4. Department of Biological Systems, Faculty of New Technologies Engineering, Zirab Campus, Shahid Beheshti University, Tehran, Iran
5. Department of Genetics, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Due to lack of an available source of Schwann cells (SCs) that have important role in peripheral nerve regeneration, Schwann-like cells transdifferentiation have attracted lots of attention among researchers. This study suggests an effective method for increasing of attachment and proliferation of human adipose derived stem cells (h-ADSCs) on the laminin coated in poly (lactic-co-glycolic acid) (PLGA) nanofibers.

Methods : The characterization of biofunctionalized PLGA including hydrophilicity, chemical and mechanical properties were evaluated. Brain-derived neurotropic factor (BDNF) and gold nanoparticles (AuNPs) were encapsulated in chitosan nanoparticles (CSNPs), added into laminin solution, and coated on the surface of aligned PLGA scaffold. The release behavior of BDNF and AuNPs from scaffold was evaluated by Bradford assay and inductive coupled plasma optical emission spectrometry (ICP-OES) technique, respectively. Afterwards, experimental groups were investigated for potential of Schwann cell differentiation using immunocytochemical staining and real-time RT-PCR technique.

Results : The presence of laminin on PLGA scaffold surface improved the hydrophilicity and help to better cell attachment in biofunctionalized scaffold. Also, laminin significantly increased both the ultimate tensile strength (UTS) and elastic modulus; however, a significant decrease was

observed in strain to failure compared to pure PLGA nanofibers (p ≤ 0.05). A constant and controlled release of BDNF and AuNPs were observed during 7 days. Results of MTT assay showed the significantly higher proliferation of h-ADSCs on laminin-functionalized scaffold compared to PLGA scaffold (p ≤ 0.05). Additionally, the presence of BDNF and AuNPs on scaffold significantly improved the expression of SCs markers as compared to the control group (p ≤ 0.05).

Conclusion : Therefore, use of biofunctionalized PLGA nanofibers can be a promising strategy for inducing the differentiation of h-ADSCs into SCs for nerve tissue engineering.

Keywords : Adipose derived stem cells, Poly lactic-co-glycolic acid, scaffold, Laminin, Brain derived neurotrophic factor, Gold nanoparticles

Count: 363
Abstract ID: 10
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

A review of cytotoxic effects of food additive azo dyes on brain-subregion

Submission Author: Seyede Fatemeh Hosseini

Seyede Fatemeh Hosseini[1]

1. Assistant professor, Department of Anatomy, Faculty Member of Tabas, School of Nursing , Birjand University of Medical Sciences, Birjand, Iran

Background and Aim : Azo dyes, as a major group of the synthetic colorants are added to food products not only to make them aesthetic but also to preserve their appearance. However, the use of azo dyes in food has been banned due to its side effects on human health throughout world. The aim of this study was to evaluate the effects of the food additive azo dyes on the brain tissues.

Methods : The search was conducted using PubMed, Scopus, Web of Science, Europe PMC beta, Science Direct, and Springer database considering all articles published up to 9 July, 2021. The inclusion criteria were double-blind, randomized, cohort studies, placebo-controlled trials, case reports, non-controlled trials, and case series.

Results : Several studies suggest the azo dyes induce oxidative stress, which subsequently increase the concentration of malondialdehyde and reduce superoxide dismutase activity and glutathione (GSH) concentration in brain tissue. Also, results showed the adverse effects of azo dyes on the brain parts such as the prefrontal cortex, cerebellum, and cerebrum which, are accompanied by changes in the brain function.

Conclusion : It can be concluded that azo dyes with an increase in oxidative stress affect the most important parts of the brain and cause brain dysfunction.

Keywords : Azo dyes, Tartrazine, Sunset yellow, Sodium benzoate, Brain-Subregions, Neurological Effects

Advances in Diagnostic Biomarkers of Central Nervous System Involvement in the Leukemia

Submission Author: Nazanin Heidari

Nazanin Heidari[1]

1. Transfusion Research Center, High Institute for Research and Education in Transfusion Medicine, Tehran, Iran.

Background and Aim : Central nervous system (CNS) involvement is a major problem in the development of hematological malignancies. Acute leukemias such like acute myeloid leukemia (AML) and acute lymphoid leukemia (ALL) most commonly show CNS involvement. In this paper we provide a description of the advances in diagnostic biomarkers of CNS involvement in leukemias.

Methods : By searching the mesh words "Central Nervous System AND Leukemia" in PubMed website, relevant English articles that dealt with human subjects as of 2000 were included in this study.

Results : A number of biomarkers including chemokine (C-X-C motif) ligand (CXCL)10, P-selectin glycoprotein ligand-1 (PSGL1), Plasminogen activator inhibitor-1 (PAI-1) and Interleukin-15 (IL-15), which are increased at the initial stage of the disease in cerebrospinal fluid (CSF) samples, can be used to evaluate the CNS involvement. In addition, chemokine (C–C motif) ligand (CCL)19, CCL21, VE-cadherin and platelet endothelial cell adhesion molecule (PECAM)-1b are diagnostic biomarkers for CNS involvement at diagnosis. The expression of surface chemokine (C-C motif) receptor (CCR)7 gene as the receptor for CCL19 and CCL21 is increased in primary peripheral blood samples of T-ALL. Also, Notch1 could induce T-ALL and target the transformed cells in CNS. It was observed that measuring serum and CSF levels of claudin5 (CLDN5), occludin (OCLN) and the CLDN5/ZO1 ratio is useful for evaluating the possible of leukaemia CNS metastasis. Increased IL-15 in blast cells is valuable to detect the potential of relapse. IL-15 increases the level of PSGL1, C-X-C chemokine receptor (CXCR)3 and SERPINE1 (PAI-1). CCL2 (MCP-1) is the diagnostic biomarker upon relapse. CCL2 increases the ability of endothelium to recruit leukocytes into CNS and disrupt the blood-brain barrier (BBB). Increased MCP-1 during treatment is associated with CNS leukemia. Also, miR-181a might provide novel tool to screen CNS disease in pediatric ALL.

Conclusion : Early detection of these factors may prevent CNS involvement, and they can also be introduced as new diagnostic approaches, which requires additional studies.

Keywords : Central nervous system; Leukemia; Biomarkers; Diagnosis

Count: 365
Abstract ID: 286
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Histologic and Histomorphometic Study on the Effects of Aloe Vera gel extract on histological changes in proximal and distal sciatic nerve in diabetic rats

Submission Author: Hamid Reza Ghaffari

Hamid Reza Ghaffari[1], Javad Porsamimi[2], Maliheh Alipour Tabrizi [3], Majid Valizadeh[4]

1. Anatomical Department, Faculty of Medicine, Zabol University, Zabol, IranAnatomical Department, Faculty of Medicine, Zabol University, Zabol, Iran
2. Department of Medical Imminology, Faculty of Medicine, Zabol University of Medical Sciences, Zabol, Iran.
3. Lithotripsy ward , Emam Reza Hospital, Mashhad, Iran
4. 4 Department of Medical Physics, Faculty of Medicine, Zabol University of Medical Sciences, Zabol, Iran.

Background and Aim : Qualitative and quantitative examinations report on the morphological changes that occur in nerve fibers and non-neuronal cells of peripheral nerve during the lifetime of the rats. Previous studies suggest that Aloe Vera has anti-oxidant effects. The sural nerve has a purely sensory function. In this study, we evaluated histologic and histomorphometric changes of proximal and distal sciatic nerve in dibetic rats treated with Aloe Vera gel extract.

Methods : Sixty healthy male albino Sprague-Dawley rats weighing 200-250 g were randomly divided into two groups: control (normal diet), and treatment group (normal diet + Aloe Vera extract). Rats in treatment group received 400 mg/kg Aloe Vera extract daily. After 16, 20 and 24 months animals were anesthetized with sodium thiopental (40 mg/kg) via IP injection. After removal of Sciatic nerve on left side, nerve dissected and fixed in 4% glutaraldehyde, post fixed in osmium tetroxide 1%, dehydrated and then embedded in TAAB resin. Thin sections (1 μm) were stained with toluidine blue stain and ten slides were prepared from each animal and examined under light microscope. Masson's trichrome stain was used to evaluate the development of fibrosis. Histologic criteria on Sural nerve were determined and data were recorded. Data analyzed by using Spss software.

Results : In this study collagen accumulated in the perineurium with diabetic neuropathy. Diabetic neuropathy in distal sciatic nerve caused a decrease in diameter of nerve trunk, nerve fiber, thickness of myelin and nerve fiber area compare with proximal sciatic nerve. The nerve fascicle diameter decreases only in the treatment group. The numbers of myelinated fibers with infolding

into the axoplasm and outfolding, irregularity of fibers, myelin sheath with unclear boundaries and alteration in myelin compaction were also increased.

Conclusion : Treatment with Aloe Vera gel prevented nerve trunk and fiber and myelin thickness changes .

Keywords : Dibet; Aloe Vera; neuropathy; proximal and distal sciatic nerve; rats.

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Exploring the cognitive developmental needs: A systematic literature review on hearing impairments and theory of mind

Submission Author: Zahra Hosseinzadeh Maleki

Zahra Hosseinzadeh Maleki[1], Zahra Hosseinzade Maleki[2], Mobina Heidari Alaleh Seyyedan [3]

1. -
2. Assistant Professor
3. Under graduated student of psychology

Background and Aim : Theory of Mind (ToM) is the advanced ability in the development of social cognition to attribute mental states to oneself and/or others, which allows individuals to manipulate behaviors. Special education should explore cognitive development to assess deficits and improve ToM development in hearing loss from preschool age. The current study conducted a systematic literature review on the theory of mind development in people with hearing loss from preschool-aged children to adulthood.

Methods : To identify relevant articles published in the period from 2000 to 2021, literature databases (SID, Magiran, and Google scholar) were searched; a primary search was performed about the relationship between ToM (e.g., Cognitive development), Hearing loss (e.g., impairment), and Childhood (e.g., Childhood); followed by a supporting search on the relationship between Special education and ToM development. The most relevant papers were selected, and data were collected from articles with inclusion criteria.

Results : The false belief test is one of the most popular methods for assessing children's ToM. Also, there are three dominant theories in the explanation of Its development. 1) children extend a dynamic approach to mental states during development (Theory theory); 2) humans think and act similarly, so simulating one's situation can help you understand one's mental state (Simulation theory); 3) a portion of the brain's neural structure is devoted to ToM processes (Modularity theory). The progress of children's ToM requires detailed research. Overall certainty in the effect estimation was ''low'' for auditory training and ''very low'' for cognitive training. There are several limitations to this review. Furthermore, in the literature of cognitive development theories, Executive functions (EFs), language, and the ability to pretend and comprehend visual attention are all related to the development of ToM and play a crucial role in its evolution. Studies focusing

on the ToM in hearing-impaired children showed that the overall pooled effect of cognitive training improvement remained statistically significant.

Conclusion : Studies should combine cognitive intervention with auditory training to enhance social cognition in children. Only studies published in English met inclusion criteria, and several domain pooled effects were supported only by two studies. There was no significant heterogeneity within the studies, providing initial confidence in the current estimate of special education improving ToM in childhood. Further research is needed to determine which training stimuli will provide optimal conditions to improve the Theory of mind in hearing loss children.

Keywords : Theory of Mind; ToM; Cognitive deficit; hearing; loss

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Investigating the effect of stress during pregnancy on the estrogen and progesterone, corticosterone, and oocyte number in first generation pilocarpine-treated female male rats

Submission Author: Ramin Ahmadzadeh

Ramin Ahmadzadeh [1], Shiva Roshan-Milani(MD, PhD)[2], Ehsan Saboory [3]

1. PhD candidate, Department of Reproductive Biology, Faculty of Modern Medical Sciences, Tabriz University of Medical Sciences
2. Professor, Department of physiology, School of Medicine, Urmia University of Medical Sciences
3. Professor Department of addiction studies, School of Medicine, Zanjan University of Medical Sciences

Background and Aim : Secreted hormons from ovary, pituitary glands and suprarenal gland may affect the follicogenesis and the number of mature oocyte. stress during pregnancy causes unusual neuronal connections in the fetal development which leads to seizure potentiation and alteration in activity of endocrine glands. In the current study, the effect of maternal immobility stress during pregnancy on sperm parameters, testosterone blood level, and sperm DNA damage was investigated in first-generation pilocarpine-treated male rats

Methods : Pregnant rats (180-220 g) were divided in two groups (n=6 each): control and stress. In the stress group, the rats were kept immobile on the 15th day of pregnancy by restrainer twice a day, for one hour, and up to 3 consecutive days. After birth, the pups were counted and divided between dams, evenly. Each dam with her pups kept in a separate cage in standard conditions. On the 25th day after birth, pilocarpine (150 mg/kg.s.c) was injected to the female pups of both groups to induce epileptic behaviors. Then, the subjects were kept in standard conditions until Puberty. On 70th day after birth, the subjects were anesthetized and studied in terms of estrogen and progesterone blood levels, Corticosterone blood levels, and oocyte number.

Results : The mean of estrogen and progesterone blood levels, oocyte number in the epileptic stress group decreased significantly compared to the control group. While, the mean of Corticosterone blood levels was significantly increased in the epileptic stress group compared to the epileptic control group.

Conclusion : It seems that the stress during the fetal period can affect the hypothalamus-pituitary axis by inhibiting the release of GnRH hormone and the synthesis of gonadotropins from the pituitary by intensifying epileptic behaviors and increasing blood corticosterone levels, but the mechanisms of this finding need further investigation.

Keywords : gestational restraint stress; estrogen and progesterone hormones; Corticosterone hormone; seizure

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The effectiveness of Play-based Motor-cognitive training program on attention of children with Attention Deficit Hyperactivity Disorder

Submission Author: Leila Kashani Vahid

Leila Kashani Vahid[1], Zahra Shahnavaz[2], Elham Hakimirad[3]

1. Assistant Proffesor, Department of Psychologoy and Special Education, Islamic Azad University, Science and Research Branch.
2. Masters in Psychologoy and Special Education, Islamic Azad University, Science and Research Branch.
3. Assisstant Proffesor, School of Psychology and Education, Shahid Beheshti University

Background and Aim : The aim of this study was to identify the effectiveness of play-based cognitive-motor training program on attention of children with attention deficit hyperactivity disorder.

Methods : This research was semi-experimental research with pre-test-post-test with control group. The statistical population of the present study is male participants with hyperactivity from two clinics in Tehran. Participants were selected by available sampling method and randomly divided into control and experimental groups. Each group included 14 children and SPSS software was used to analyze the findings.

Results : The results showed that there was a significant difference between the experimental and control groups in the attention of the participants.

Conclusion : It can be concluded that the intervention of cognitive games in improving attention of the participants. It was also concluded that play-based motor-cognitive was effective in improving attention in children with ADHD and in the treatment of cognitive and motor disabilities.

Keywords : Cognitive-motor educational games, attention, children with Attention Deficit Hyperactivity Disorder.

Count: 369
Abstract ID: 145
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Appraisement of CNTNAP2 expression illuminates the involvement of CNTNAP2 in incidence of ASD and determines the alignment of these expression changes with Theory of Mind features

Submission Author: Rana Ghamari

Rana Ghamari[1], Mehdi Tehrani-Doost[2], Atiye Sarabi-Jamab[3]

1. Department of Genetics, Faculty of biology, Kharazmi university, Tehran, Iran
2. Department of Psychiatry, Research Center for Cognitive and Behavioral Sciences, Tehran University of Medical Sciences, Tehran, Iran
3. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

Background and Aim : ToM-the ability to attribute a mental state to ourselves and other social agents- is one of the major aspects of social interaction and communication impairments in autism spectrum disorder (ASD). In humans, language and the theory of mind (ToM) are two inseparable cognitive components. High-order manifestations of the theory of mind, such as social communication, sarcasm, irony, and humor are practically impossible without specified language skills. This cognitive phenomenon could originate from the shared genetic architecture of ToM and language. human chromosome 7 long arm (7q) is one of the evolutionary turning points in the human genome which differentiates us from other Homo species. The results of previous studies clarified that this chromosomal region contains genes that are significantly associated with verbal skills. Contactin Associated Protein 2 (CNTNAP2) or Neurexin IV (NRXN IV) which is located in 7q35 belongs to the Neurexins family and is significantly associated with language/verbal skills and social cognition alterations based on various investigations. Despite the salient role of CNTNAP2 in verbal abilities and social cognition, up to now, no study has assessed the association of CNTNAP2 expression alterations with ASD and verbal ToM. Thus, in this study, we aimed to evaluate CNTNAP2 expression alterations in ASD individuals, examining CNTNAP2 expression correlation with verbal and non-verbal ToM and modeling ASD leveraging cognitive and genetic variables.

Methods : Forty-four children and adolescents with high-function autism aged between 8 to 18 years old and 44 matched age and sex typically developed (TD) individuals participated in the study. The blood sample was collected from all participants for whole blood RNA extraction and CNTNAP2 expression was measured by SYBR green Real-time PCR. Happe's Strange Stories and moving shapes paradigm tasks were respectively used for verbal and non-verbal ToM assessment.

Moreover, social functioning was appraised utilizing the social responsiveness scale (SRS) questionary. The statistical interpretation was performed in the confidence interval of 95% using R programming language and in the RStudio environment.

Results : Our results illustrated a significant difference in CNTNAP2 expression between ASD patients and TD individuals (p-value = 5.321×10-5). Further investigations revealed that CNTNAP2 expression 2.5-fold increased in TD subjects compared to ASD individuals. Moreover, correlation test results demonstrated significant positive correlation between CNTNAP2 expression and both Happe's Strange Stories (R = 0.430, p-value = 3.110×10-5) and moving shapes paradigm (R = 0.420, p-value = 5.073×10-5) verbal scores in TD group. Finally, the forward selection of parameters utilizing the Akaike information criterion (AIC) method suggested that non-verbal ToM parameter and CNTNAP2 expression could significantly model ASD and might be putative predictors of ASD.

Conclusion : Briefly, here we found that CNTNAP2 downregulates in ASD blood samples compared to healthy controls. Besides, our results not only highlighted the significant correlation of CNTNAP2 expression with two ToM endophenotypes but also suggested a cognitive model for ASD. Future studies should investigate the reliability of the findings of this study.

Keywords : Autism spectrum disorder; Theory of Mind; CNTNAP2; social functioning; Happe's Strange Stories; moving shapes paradigm

Count: 370
Abstract ID: 306
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Investigating the attention network in children with learning disabilities

Submission Author: Alirezaie hoor Mohsen

Alirezaie hoor Mohsen[1], Leyla Rastgar Farajzadeh[2]

1. Master Department of Psychology, Payam Noor University, South Tehran Branch, Tehran, Iran
2. PhD student Neuroscience Department, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Attention is one of the most important cognitive functions, which is introduced as the ability to focus the mind on a task or topic and is a very important prerequisite for fulfilling daily activities. Recent advances in psychology and cognitive neuroscience indicate the existence of multiple attention networks in the brain, each of which displays a different type of attention. Based on Posner and Patterson's neurocognitive model, attention includes three neural networks: warning, orientation, and executive control. The aim of this study was to investigate the attention network in children with learning disabilities. This research included 60 children with learning disabilities and normal children.

Methods : These 7 to 9-year-old children were selected by purposeful sampling from the first to third grades of normal schools in Ardabil city. Children with learning disabilities were evaluated through a clinical interview and a researcher-made questionnaire to collect data. They were matched based on IQ and finally they were placed in two groups of children with learning disabilities and normal children. Both groups were evaluated with the attention network test (Roda et al., 2004). This test has three dimensions: warning, orientation, and executive control. In this experiment, participants are told that a hungry fish appears on the screen and are instructed to feed the fish by pressing the button on the keyboard that corresponds to the direction of the fish (right or left key).

Results : The results show that there is no significant difference between the average of the two groups in the warning network. The orientation network is significant in learning disorders, especially mathematics($P<0.05$). The orienting network refers to the ability to prioritize sensory input by selecting a modality or location that is centered on the parietal cortex. A significant difference in the orientation network in math learning disorder is probably due to similar brain regions involved in this disorder and the orientation network. Also, there is a significant difference between the average of the two groups in the executive attention network and the total score($P<0.01$). The executive attention network includes conflict resolution and decision control,

error detection, and normal response inhibition, with the anterior cingulate cortex associated with this function.

Conclusion : Taken together, the results of this research show that the attention network is likely to be particularly affected in learning disorders. It seems that more research is needed for a more accurate allocation of the attention networks involved in learning disorder by separating the subtypes of this disorder.

Keywords : attention, learning disabilities

Count: 371
Abstract ID: 456
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Effects of post-weaning enriched environment on behavioural symptoms in MK-801-induced schizophrenia model

Submission Author: Mahdieh Parvan

Mahdieh Parvan[1], Masoumeh Nozari[2], Neda Salmani[3]

1. Department Of Physiology, School of Medical Sciences, Kerman University of Medical Sciences, Kerman, Iran
2. Department Of Physiology, School of Medical Sciences, Kerman University of Medical Sciences, Kerman, Iran
3. Department of Psychology, Zarand Branch, Islamic Azad University, Kerman, Iran

Background and Aim : Based on the clinical observations of severe cognitive deficits in schizophrenia patients and the relationship between environmental parameters and the severity of schizophrenia symptoms, the present study investigated these parameters in a dizocilpine (MK-801)-induced schizophrenia model in rats.

Methods : Male Wistar rat pups were injected peritoneally with MK-801 (1 mg/kg) on a daily basis between the 6th and the 10th postnatal days and were exposed to either an enriched or a standard cage from P21 until the end of the experiments. The rats were evaluated in open-field and three-chamber social interaction tests.

Results : Increased stereotyped behaviour (self-grooming, exploratory behaviour) and deficits in social Behaviour were observed in the MK-801 treatment group. Housing in an enriched environment improved behavioural deficits associated with postnatal MK-801 treatment.

Conclusion : The results suggested that NMDA receptor hypofunction may cause susceptibility to these behaviours and indicated the importance of environmental conditions in the development of schizophrenia and probably other neuropsychiatric disorders.

Keywords : enriched environment, MK-801, schizophrenia

Count: 372
Abstract ID: 446
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Effects of Abalone Game on Focusing and sustained Attention athletes with ADHD

Submission Author: Shirin Ahmadnezhad

saba esmaeili[1], fereshteh amouzadeh[2], shirin ahmadnezhad[3], fatemeh borzoei[4], mostafa amouzadeh[5]

1. department of sports sciences,faculty of literature and human sciences, khorramabad, iran
2. Ph.D. in sport Psychology, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Tehran, Tehran, Iran
3. department of sports sciences,faculty of literature and human sciences, khorramabad, iran
4. department of sports sciences,faculty of literature and human sciences, khorramabad, iran
5. Computer engineer, Faculty of Computer Engineering, University of Lorestan, Lorestan, Iran.

Background and Aim : ADHD is a disorder of chronic that results in abnormal levels of inattention, hyperactivity, or combination, and it's common in athletes. Young athletes with ADHD may experience problems with specific movements required in competitive sports and may manifest problems with focus and attention or coordinated activity. The aim of this study was to investigate the effects of abalone game on focusing and sustained attention in athletes with ADHD

Methods : 30 athletes with ADHD, 12-14 years old with an age average (13.12 ± 1.24 years) were randomly selected and divided into control and experimental groups (n=15 in each group). The experimental group performed an abalone Game for 8 weeks, 3 sessions per week. The control group didn't have any intervention. integrated Visual and Auditory Continues Performance Test)IVA) were conducted to determine the effects of abalone game on focusing and sustained attention athletes with ADHD. Statistical analysis was performed using SPSS software version 21. ($p<0.05$)

Results : The results of variance analysis with repeated measures showed a significant improvement in focusing and sustained attention in athletes with ADHD ($p=0.017$) in the experimental group. Based on the results of the follow-up test, it remained stable 4 weeks after the post-test.

Conclusion : According to the obtained results, abalone Game has a positive and significant effect on focusing and sustained attention in athletes with ADHD. And according to the stable training results, it is suggested to use abalone game to improve performance in athletes with ADHD.

Keywords : Abalone Game, Focusing, athletes with ADHD.

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Count: 373
Abstract ID: 357
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Myalgia in COVID-19 patients is associated with Fas/FasL interactions; A translational bioinformatics, molecular, and clinical study

Submission Author: Kiarash Saleki

Kiarash Saleki[1], Moein Shirzad[2], Mostafa Javanian[3], Sheyda Mohammadkhani[4], Mohammad Hossein Alijani[5], Niloufarsadat Miri[6], Morteza Oladnabi[7], Abbas Azadmehr[8]

1. 1Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran, 2Student Research Committee, Babol University of Medical Sciences, Babol, Iran, 3USERN Office, Babol University of Medical Sciences, Babol, Iran, 4National Elite Foundation, Mazandaran Province Branch, Mazandaran, Iran,
2. 1Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran, 2Student Research Committee, Babol University of Medical Sciences, Babol, Iran, 3USERN Office, Babol University of Medical Sciences, Babol, Iran, 4National Elite Foundation, Mazandaran Province Branch, Mazandaran, Iran,
3. 5Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran,
4. 2Student Research Committee, Babol University of Medical Sciences, Babol, Iran,
5. 2Student Research Committee, Babol University of Medical Sciences, Babol, Iran,
6. 1Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran,
7. 6Ischemic Disorders Research Center, Golestan University of Medical Sciences, Gorgan, Iran,
8. Corresponding author: 1Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran 4 National Elite Foundation, Mazandaran Province Branch, Mazandaran, Iran, 7Immunology Department, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Published paper Frontiers immunology link:Impact factor 8.8 https://www.frontiersin.org/articles/10.3389/fimmu.2022.947401/full Detection of cytokine storm starting factors associated with uncontrolled inflammatory immune feedback is required in COVID-19. Also, inflammation is associated with neuropathic pain. Therefore, we investigated the relationship of Fas/FasL expression with myalgia in COVID-19 patients. Another major goal of this world-first study was the exploration of Fas/Fas Ligand (FasL) role in lung involvement and death of COVID-19 patients.

Methods : In this case-control experiment, mild (outpatient), moderate (hospitalized), and severe (ICU) COVID-19 patients and healthy subjects were enrolled. Serum sFas/sFasL protein by ELISA and severity of lung involvement by CT-scan were evaluated. Also, we docked and

modelled Fas and FasL via Bioinformatics software (in silico) to generate the optimal Fas/FasL complex and conducted molecular dynamics simulation (MDS) in fever (COVID-19), and healthy conditions, to simulate inflammation in patients with neuropathic pain.

Results : Clinical presentations of COVID-19 patients were fever in 38 patients (57.57%), cough in 36 patients (54.55%), weakness in 31 patients (46.7%), myalgia in 30 patients (45.45%), nervous system symptoms in 22 patients (33.33%)Increased sFasL protein in serum was linked to reduced lung injury and mortality. Moreover, sFas and sFasL levels were higher in the mild COVID-19 group compared to the control group. Moreover, mFas expression showed an inverse correlation with myalgia[/neuralgia] presentations in COVID-19 patients. Critical COVID-19 patients had lower sFas and sFasL levels compared to the control group. Bioinformatics analysis confirmed that blood profile alterations of COVID-19 patients fever could affect Fas/FasL complex interactions. Our translational findings showed that decreased Fas/FasL was linked to higher lung injury, severity, and death in COVID-19 cases. Results of study suggested that sFasL is a mediator of neutrophilia and lymphopenia in COVID-19. This high neutrophil lymphocyte ratio (NLR) in COVID-19 could be associated with significantly higher risk of developing peripheral neuropathy complication in COVID-19, as demonstrated in other conditions in previous research.

Conclusion : We found that myalgia is associated with Fas expression and that even small changes in temperature could alter Fas/FasL interactions in silico. Further, this is the first study ever indicating that the serum sFasL protein is a severity/mortality prognostic biomarker for the clinical management of COVID-19. Also, we found that prevalence of myalgia, especially during the first waves of the COVID-19, were very high and even comparable to the prevalence of respiratory symptoms. A restriction in the present study was precise differentiation of neuralgia and myalgia (nerve vs. muscle damage). There may also be additional players responsible for these observations. Of note, according to our earlier hypothesis (DOI: 10.1515/revneuro-2021-0047) the triangle of Neuropilin-1, viral infection, and cytokine storm may be responsible for the neurological complications in COVID-19 patients. Further interaction of the complex cytokine network and novel entry molecules such as neuropilin-1 could also be evaluated in future research.

Keywords : Neuropathic pain; Myalgia; COVID-19; Fas/Fas Ligand; Hyperinflammation

Count: 374
Abstract ID: 279
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Efficacy of combination of Viola odorata, Rosa damascena and Coriandrum sativum in prevention of migraine attacks: a randomized, double blind, placebo-controlled clinical trial

Submission Author: Rostam Seifadini

Rostam Seifadini[1], Mohadeseh Kamali[2], Haleh Tajadini[3], Mitral Mehrabani[4]

1. Neurologist, Assistant Professor, Neurology Research Center, Kerman University of Medical Sciences, Kerman, Iran
2. PhD of Persian Medicine , Neurology Research Center, Kerman University of Medical Sciences, Kerman, Iran
3. PhD of Persian Medicine, Assistant Professor, Neurology Research Center, Kerman University of Medical Sciences, Kerman, Iran
4. Pharmacognosist, Professor, Department of Pharmacognosy, Herbal and Traditional Medicines Research Center, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Migraine is the second most common type of headache after tension headaches. In Iranian traditional medicine several herbal drugs are used for the treatment of headache. Including, a product of Iranian traditional medicine, a combination of Viola odorata L. flowers, Rosa damascena L. flowers and Coriandrum sativum L. fruits. To determine the effectiveness of a combination of Viola odorata flowers, Rosa damascene flowers and Coriandrum sativum fruits on severity, duration and frequency of migraine headaches.

Methods : This randomized, double blind, placebo-controlled clinical trial was performed on 88 patients who had migraine and visited Besat Neurology Clinic No. 4 at Kerman University of Medical Sciences, Kerman, Iran, from September 2016 to march 2017. Patients were randomly divided into the intervention (n=44) or placebo group (n=44). The intervention group received a product of Iranian traditional medicine, a combination of Viola odorata L. flowers, Rosa damascena L. flowers and Coriandrum sativum L. fruits in 500 mg capsules three times a day and propranolol 20mg tablet twice a day, and the control group received placebo capsules (500mg) three times a day and propranolol 20mg tablet twice a day for four weeks. Patients were asked to report the frequency, duration and severity of their headaches in designed forms at home. Then at the end of the 2nd and 4th weeks of treatment, patients were followed for clinical efficacy.

Results : In terms of duration, frequency and severity of headaches between the two groups of herbal medicine and placebo, the behavior of the two protocols was changed over time ($p<0.001$). During the 4 weeks, the time and drug interactions, were significant ($p <0.001$). In other words, the pattern of changes to the two protocols over time, was different. Also, at the end of the 4th week, there was a significant difference between the two groups ($p<0.001$).

Conclusion : The study findings suggest that the Iranian traditional product combination of Viola odorata flowers, Rosa damascena flowers and Coriandrum sativum fruits may be effective in improving headaches in patients with migraine.

Keywords : Migraine, Headache, Viola, Coriandrum, Traditional medicine

Count: 375
Abstract ID: 106
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Adolescent morphine exposure changes endogenous opioid response to pain

Submission Author: Kawsar Alami

Kawsar Alami[1], Elmira Ghasemi[2], Saeed Semnanian[3], Hossein Azizi[4]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Adolescence is the most sensitive and critical period for brain development. Risky behaviors, especially drug abuse is highly prevalent in this tumultuous period. It is well known that morphine exposure during adolescence may have long-lasting effects, and can alter brain development and subsequent behaviors, especially pain-related behaviors throughout life. Moreover, the opioid system develops neurologically during adolescence, and it is highly vulnerable to drug exposure. Periaqueductal gray (PAG) is an important component of the pain matrix and is involved in opioid-based analgesia. However, the analgesic response of endogenous opioids in adulthood following adolescent morphine exposure is still unknown. This study is aimed to investigate the long-lasting effects of adolescent morphine exposure on analgesic response to morphine microinjection into the ventrolateral PAG (vlPAG) and its effect on formalin tests during adulthood.

Methods : Adolescent male Wistar rats received escalating doses of morphine (2.5 - 25 mg/kg, s.c.) or an equal volume of saline, twice daily for 10 days (PND 31 - 40). After 30 days of washout period, adult rats received microinjection of morphine, naloxone, or saline into the vlPAG and a formalin test was performed (PND 70).

Results : The results showed a significant increase in nociceptive behaviors of the adolescent morphine-treated group compared to the saline one. Moreover, there was a significant difference in analgesic response to the microinjection of morphine into the vlPAG between the adolescent morphine-treated group and the saline one. Also, there was a significant increase in response to naloxone than saline microinjection in vlPAG of the adolescent saline-treated group. However, no significant increase in pain behavior was seen in response to naloxone microinjection in vlPAG of the adolescent morphine-treated group.

Conclusion : These findings indicate that adolescent morphine exposure has long-lasting effects on inflammatory pain-related behaviors in adulthood and may change the opioid endogenous system in vlPAG.

Keywords : Morphine; Naloxone; Adolescence; Formalin test; Pain; vlPAG

Count: 376
Abstract ID: 138
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Inflammatory Pain Increases Excitability in Locus Coeruleus Neurons

Submission Author: Fatemeh Farahani

Fatemeh Farahani[1], Hossein Azizi[2], Saeed Semnanian[3]

1. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : The locus coeruleus (LC) nucleus with extensive ascending and descending projections has a critical role in modulating pain. Some studies indicate how the LC-NA system can remain more active after painful stimulation. In the present study, we examined whether formalin-induced inflammatory pain may affect the electrophysiological properties of LC neurons after 24 h.

Methods : Inflammatory pain was induced by subcutaneous injection of 2% formalin (10 µL) into the hind paw of 14-21 day-old male Wistar rats. After 24 h, horizontal slices of brain stem containing the locus coeruleus were prepared and whole-cell patch-clamp recordings were carried out on LC neurons.

Results : Findings revealed that LC neurons from formalin injected rats had a significant enhancement in firing rate, half-width, and instantaneous frequency of action potentials, but their resting membrane potential, input resistance, and afterhyperpolarization amplitude almost remained unchanged. In addition, action potential peak amplitude, maximum rise slope, maximum decay slope, first spike latency, and rheobase current significantly decreased in LC neurons obtained from formalin-treated rats.

Conclusion : For the first time, we demonstrate that inflammatory pain after 24 h induces hyperexcitability in LC neurons, which in turn may result in changes in noradrenaline release and pain processing.

Keywords : Locus coeruleus, Formalin, Inflammatory pain, Patch-clamp recording, Hyperexcitability

Count: 377
Abstract ID: 89
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Analgesic effect of cedrol on neuropathic pain in rats

Submission Author: Fatemeh Forouzanfar

Fatemeh Forouzanfar[1]

1. 1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Injured somatosensory nervous system cause neuropathic pain which is quite difficult to treat using current approaches. It is therefore important to find new therapeutic options.

Methods : We have analyzed cedrol effect on chronic constriction injury (CCI) induced neuropathic pain in rats. The mechanical and thermal hypersensitivity were evaluated using the von Frey filament, radiant heat and acetone drop methods. The changes in the levels of biomarkers of oxidative stress including malondialdehyde (MDA) and total thiol (SH), as well as inflammatory mediators including Tumour Necrosis Factor alpha (TNF-α) and Interleukin 6 (IL-6) were estimated in the lumbar portion (L4–L6) of neuropathic rats.

Results : Administration of cedrol attenuated the CCI-induced mechanical and thermal hypersensitivity. CCI produced an increase in MDA along with a reduction in SH levels in the spinal cord of the CCI rats. Reduced levels of SH were restored by cedrol. Also, the levels of MDA were reduced in the cedrol-treated CCI rats compared to the untreated CCI rats. Besides, level of TNF-α and IL-6 increased in the spinal cord of CCI group and cedrol could reverse it.

Conclusion : The current study showed that cedrol attenuates neuropathic pain in CCI rats by inhibition of inflammatory response and attenuation of oxidative stress.

Keywords : Neuropathic pain, Cedrol, Oxidative stress, Inflammation, Medicinal plants

Count: 378
Abstract ID: 193
subject: Pain and Sensory Systems: Multisensory Integration
Presentation Type: Poster

Association Adherence of dietary diversity score (DDS) with migraine headache severity

Submission Author: Atieh Mirzababaei

Atieh Mirzababaei[1]

1. Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS)

Background and Aim : Migraine is an episodic disorder that is characterized by unilateral headache lasting 4–72 h along with certain associated features. Modifying dietary habits have been considered an appropriate therapeutic approach in these patients. This study was designed to examine the association between dietary diversity score (DDS) and severity, frequency, and duration of migraine attacks

Methods : The present study was conducted using a cross-sectional design on 256 women 18–50 years old referred to neurology clinics for the first time. After the diagnosis of migraine by a neurologist, the data related to anthropometric measures and dietary intake (147-item semi-quantitative food frequency questionnaire) were collected. To assess migraine severity, the migraine disability assessment questionnaire (MIDAS), visual analog scale (VAS), and a 30-day headache diary were used. Multinomial logistic regression was used to evaluate the association between DDS and migraine severity. The age, physical activity, BMI, and job were considered confounding variables in regression model. Data were analyzed using SPSS software and P values < 0.05 considered statistically significant.

Results : Totally, 256 subjects participated in the present study with mean age, height, weight, and BMI of 34.28 ± 7.88 years, 161.78 ± 5.18 cm, 69.25 ± 13.06 kg, and 26.46 ± 4.89 kg/m2, respectively. Subjects with higher DDS had a lower waist circum ference (P = 0.01). There was no association between DDS and other anthropometric measures and demographic characteristics (P > 0.05). In the crude model of logistic regression, participants with lower DDS had higher odds of more pain severity (OR = 2.30; 95% CI = 1.28, 4.12; P = 0.005), migraine disability (OR = 2.66; 95% CI = 1.51, 4.69; P = 0.001), and headache duration (OR = 2.32; CI = 1.22, 4.40; P = 0.01) compared to reference group. No association was found between headache frequency and DDS. Adjusting for the effect of confounding variables did not change the significant association

Conclusion : DDS was inversely associated with migraine disability, pain severity, and headache frequency. Additional studies are needed to replicate these findings and to explore mechanisms that mediate the association between DDS and migraine attacks

Keywords : Dietary diversity . Migraine . Headache . Disability . Visual analog scale

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February 13-14, 2023   **Tehran, Iran**

Dietary nutrients patterns can may reduce intensity and duration of migraine headaches

Submission Author: Atieh Mirzababaei

Atieh Mirzababaei[1]

1. Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS)

Background and Aim : Migraine is a complicated brain disorder which affects approximately 12% of the population, whilst the presence of migraine headaches is typically higher in women than men. Several nutrients are posited to improve headache severity. The aim of this study was to investigate the relationship between dietary nutrients patterns and intensity and duration of migraine headaches

Methods : This cross-sectional study was conducted with 266 women. Physical activity, general characteristics, anthropometric values, and dietary intake were collected. Nutrient patterns were derived using principal component analysis (PCA) with varimax rotation, and based on the correlation matrix, after completing the 147 item semi-quantitative food frequency questionnaire (FFQ), we discerned 3 nutrients patterns. The validated Migraine Disability Assessment (MIDAS) questionnaire and Visual Analog Scale (VAS) was used for assessing migraine intensity. Duration of headaches were defined as the hours the participants had headache in one day in last month. Chi-square, ANOVA, and linear regression tests were used to interrogate the data

Results : Linear regression showed there was a positive relationship between second pattern rich in vitamin B1, carbohydrate, vitamin B3, vitamin B9, protein, and total fiber and VAS and pain duration. Furthermore, there was an inverse relationship between MIDAS and the first nutrient pattern characterized by dietary calcium, vitamin A, vitamin K, vitamin C, vitamin B6, vitamin B2, and Magnesium among women

Conclusion : there was a positive significant association between vitamin D and B12 (pattern 3) and headache duration. Dietary nutrients patterns should be monitored closely in individuals suffering with migraine.

Keywords : migraine, dietary nutrients pattern, Migraine Disability Assessment questionnaire, Visual Analog Scale, headache

11th Basic and Clinical Neuroscience Congress 2022
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Effects of Virtual Reality Rehabilitation in Patients after Knee Arthroplasty.

Submission Author: Fatemeh Rahimi

Fatemeh Rahimi[1], Parisa Arzani[2]

1. Assistant Professor, Shahrekord University of Medical Sciences, Shahrekord, Iran.
2. Assistant Professor, Department of Physiotherapy, School of Rehabilitation Sciences, Semnan University of Medical Sciences, Semnan, Iran.

Background and Aim : Osteoarthritis (OA) is a common health problem leading to pain, limitation in physical function, a decrease in the quality of life and disability. In the end stage of disease arthroplasty is performed. Advances in medical technology have resulted in the possibility of using computer-assisted interventions in rehabilitation. Physical exercises in the form of exergames and virtual reality are increasingly used in rehabilitation. The present review is aimed at surveying the effects of virtual reality (VR) in the rehabilitation of elderly.

Methods : This literature review was carried out in five databases: PubMed, Medline, Web of Science, Scopus and PEDro. A total of 294 articles were found, and after the removal of duplicates, 196 titles and abstracts were screened. From the screened abstracts, 27 studies were read in full text. 21 of those were excluded for the following reasons: conference papers, low quality randomized controlled trial (RCT), intervention not relevant or wrong population (concerning also other types of OA, ankle arthroplasty, or a not well defined population).Finally six randomized controlled trials focused on the application of games and biofeedback in the rehabilitation of patients after knee arthroplasty.

Results : The results of four studies showed no differences between the interventions based on VR and standard physical therapy. One study concluded VR training has better effect at improving knee functional recovery, ROM and relieving pain after TKA than standard exercises. The fifth study demonstrated improvement in pain and ROM in both groups, but the effects in the study group lasted longer than in controls.

Conclusion : The benefits of VR-based rehabilitation are unclear, although interventions based on VR are promising in view of pain management, postural and proprioception training so further high-quality studies are needed to create clinical guidelines.

Keywords : rehabilitation; virtual reality; knee arthroplasty; physical therapy

11th Basic and Clinical Neuroscience Congress 2022
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A history of ethanol intake accelerates the development of morphine analgesic tolerance: A protective potential for omega-3 fatty acids

Submission Author: Seyed Mohammad Ahmadi Soleimani

Seyed Mohammad Ahmadi Soleimani[1], Hossein Azizi [2], Alireza Abbasi-Mazar [3]

1. Deparment of physiology, school of paramedical sciences, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.
3. Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran.

Background and Aim : Adolescence is a critical life period during which significant neurodevelopmental changes occur within the central nervous system. Consistently, substance abuse in this stage has been found to induce persistent changes in brain responsiveness to future drug challenges. Nowadays, heavy episodic alcohol consumption during adolescence, known as binge drinking behavior, is a growing concern in modern societies. On the other hand, alcohol is well known to act as a gateway drug, i.e., it promotes the individual's craving for consumption of other drugs of abuse. With this in mind, we aimed to assess whether adolescent ethanol exposure could alter the development of tolerance and dependence to morphine, as an available common opioid drug.

Methods : Tail flick test was used to measure thermal nociceptive changes in adult male Wistar rats undergone ethanol/vehicle exposure during adolescence. Furthermore, morphine withdrawal syndrome was induced by naloxone injection and behavioral signs were recorded for 20 min.

Results : It was found that adolescent ethanol intake facilitates morphine analgesic tolerance and decreases baseline latency, however, severity of dependence is not significantly altered. Moreover, we found that 15 days of treatment with omega-3 fatty acids (O3) prevents the mentioned ethanol-induced changes suggesting a therapeutic potential for this compound.

Conclusion : O3 supplementation, as an inexpensive and non-invasive method, may assist the clinicians to reverse the adverse effect of alcohol binge drinking on adolescents' brains and to reduce the vulnerability to drug exposure in adulthood.

Keywords : Ethanol, omega-3, adolescence, morphine, tolerance, dependence, analgesia

Count: 382
Abstract ID: 49
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Anti-neuropathic pain activity of Amitriptyline by suppressing the inflammatory cytokines in the CCI Model Neuropathic Pain in Rats: The Role of Nitric Oxide Signalling Pathway

Submission Author: Amin Hasanvand

Amin Hasanvand[1]

1. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran.

Background and Aim : It is known that nitric oxide is produced in a large amount during neural and inflammatory pains, on one hand it causes neuronal apoptosis and on the other hand it increases pain transmission. In this study, we investigate the inhibitory role of the nitric oxide signaling pathway with amitriptyline in the treatment of neuropathic pain.

Methods : Forty rats were randomly divided into five groups (eight animals per group): 1: Sham-operated (Sham), 2: CCI vehicle-treated (CCI), 3: CCI+amitriptyline(AMIT. 10 mg/kg), 4:CCI+AMIT.(10 mg/kg)+L-arginine(100 mg/kg), 5:CCI+ AMIT.(10 mg/kg)+L-NAME (5 mg/kg). On the fourth, seventh, and fourteenth days after CCI induction, behavioral tests are performed, and on the last day, blood samples are also taken to check the level of inflammatory cytokines. Also, we will isolate the sciatic nerve on the same day to check histological studies.

Results : The results showed that the consumption of amitriptyline can reduce the level of inflammatory cytokines and on the other hand, it improves the symptoms of neuropathic pain. This is despite the fact that with the simultaneous use of L-NAME, the therapeutic effects of amitriptyline are increased, and the beneficial effects of amitriptyline are inhibited by inducing the stimulation of nitric oxide with L-arginine.

Conclusion : It was found that one of the mechanisms of improving neuropathic pain by amitriptyline can be caused by the inhibition of nitric oxide signalling pathway. In this experiment, these effects were increased with the simultaneous consumption of L-NAME and inhibited with the simultaneous consumption of L-arginine.

Keywords : Neuropathic Pain, Amitriptyline, Nitric Oxide

Count: 383
Abstract ID: 28
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Anti-inflammatory effect of fluoxetine on TLR4 JNK genes expression

Submission Author: Hoda Mojiri Forushani

Hoda Mojiri Forushani[1], Maryam Adelipour[2], Asma Mohammadi[3]

1. Abadan University of Medical Sciences
2. Department of Clinical Biochemistry, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. Abadan University of Medical Sciences

Background and Aim : Selective serotonin reuptake inhibitors (SSRI) are the commonest therapeutic option to treat major depression. Recent studies have reported an association between depression and inflammation as well as the significant effect of SSRI on anti-inflammatory actions. According to "macrophage theory" in patogenisis of depression, the current research was done to evaluate the impact of fluoxetine as a SSRI on the expression of some inflammatory genes, such as TLR4/JNK in RAW 264.7 macrophage cell to elucidate the probable mechanism of fluoxetine on inflammation process.

Methods : Using an in vitro model of lipopolysaccharide (LPS) and RAW264.7 cells macrophages. Pretreatment of the Cells was done by various doses (5 , 10, 20 µg/ml) of fluoxetine to investigate their ability to TLR4/ JNK expression after 24 and 48h of stimulation with lipopolysaccharide. Quantitative real-time (RT)-PCR in cells was used.

Results : The expression TLR4/ JNK was significantly decreased by fluoxetine in RAW264.7 after 24 h in LPS administration, but fluoxetine couldn't restore the elevated expression of JNK after 48 h in LPS. Expression of TLR4 significantly decreased in compare to LPS group after 48 h in LPS administration in RAW264.7 cells macrophages.

Conclusion : Fluoxetine exert anti-inflammatory properties, mainly due to the inhibition of TLR4/ JNK genes expression in macrophage cell. Obviously more evaluations are needed to clarify the exact involved mechanisms.

Keywords : Fluoxetine, Anti-inflammatory,TLR4, JNK

Count: 384
Abstract ID: 249
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

The interaction effects of intra-cerebral injection of the crocin with the α2-adrenoceptors on memory deficit and synaptic plasticity of hippocampal neurons in chronic pain in rat

Submission Author: Lida Tahmasebi

Lida Tahmasebi[1], Farideh Bahrami[2], Hedayat Sahraei[3], Zeynab Shankaei[4], Shima Shahyad[5], Zahra Bahari1[6]

1. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
2. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
3. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
4. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
5. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
6. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

Background and Aim : Patients with chronic pain exhibit deficits in memory. Herbal compounds are used to treat many diseases. Saffron is one of these plant compounds that many studies are being done today on its effects on the body. In traditional medicine, saffron is used for its beneficial therapeutic effects in relieving pain and improving memory. Additionally, α2-adrenoceptors that are wildly expressed in the brain have an important role in modulating both pain information and memory formation. In the present study we investigated the interaction effects of crocin (saffron active ingredient) with central α2-adrenoceptors on pain comorbidity (special memory deficit) and also hippocampal synaptic plasticity changes following chronic constriction injury (CCI) of sciatic nerve in rat

Methods : Initially, one-sided cannulation inside the lateral ventricle using the coordinates of the Paxinos atlas. The animal was then given a three-day recovery period. On day 4, after cannulation, the neuropathic surgical model was created by tying four loose knots on the sciatic nerve trunk. The injections of the drugs started from the day the neuropathic surgery was performed (Forty minutes before the desired tests), and continued for fifteen days (Crocin 40μg/μl, , α2- antagonist Yohimbin 10μg/μl). spatial learning and memory, was assessed by using the Barnes Maze on days 11, 12, 13, and 14. Synaptic plasticity was assessed using electrophysiological field recording technique (recording of field potentials) in hippocampal neurons. The statistical analysis of data was performed by analysis of variance (one-way & two-way ANOVA) followed by Tukey post hoc analysis. In all cases differences were considered significant if $p < 0.05$

Results : We observed that crocin induced analgesic and memory enhancer action following CCI surgery. Furthermore, crocin significantly increased long-term potentiation (LTP) (increased fEPSP slope and population spike amplitude). Furthermore, the co-injection of yohimbine effectively decreased analgesic and enhancer action of crocin on the LTP parameters (fEPSP slope and population spike amplitude)

Conclusion : Our study provided information about the protective effects of crocin on pain responses, spatial memory and synaptic plasticity in hippocampal neurons. Additionally, it seems that protective effects of crocin on pain responses and synaptic plasticity are mediated by α2-adrenoceptor in rats with chronic pain

Keywords : Neuropathic pain, CCI, Crocin, Yohimbin, Memory deficit, Hippocampus, Synaptic plasticity

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The effect of fall history on physical performance in patients with multiple sclerosis

Submission Author: Razieh Mofateh

Razieh Mofateh[1]

1. Department of Physiotherapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : Identifying contributing factors for falls and mobility limitations in patients with multiple sclerosis (PwMS) is necessary. This study was aimed to explore differences in physical performance measures between PwMS with and without fall history.

Methods : A total of forty-six PwMS were included in this study. Patients were categorized in two groups: non-fallers (n=23, patients with no history of falls), and fallers (n=23, patients who reported at least two falls in the 6-month period prior to the testing date). Physical performance was assessed using timed up and go test (TUG), 2-minute walk test (2MW), cognitive 2MW test, 10-meter walk test (10MW), and cognitive 10MW test.

Results : The findings showed that total duration to complete the TUG test was significantly higher in MS fallers compared to non-fallers (p= 0.03). In contrast, maximum walking speed in the 10MW test and cognitive 10MW test was significantly slower in MS fallers compared to non-fallers (p= 0.02). In addition, the distance walked in the 2MW test and cognitive 2MW test was significantly lower in MS fallers compared to non-fallers (p= 0.01 and p= 0.03, respectively).

Conclusion : Our results demonstrated impaired physical performance in PwMS with fall history. Therefore, improvement of physical performance should be considered in designing rehabilitative interventions to reduce risk of falling in PwMS.

Keywords : Multiple sclerosis, Physical performance, Fall history, Gait.

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Count: 386
Abstract ID: 88
subject: Motor Systems
and Movement Disorders: Posture and Gait
Presentation Type: Poster

Comparison of gait variability between healthy controls and patients with multiple sclerosis with high and low fear of falling

Submission Author: Razieh Mofateh

Razieh Mofateh[1]

1. Department of Physiotherapy, School of Rehabilitation Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background and Aim : Fear of falling (FOF) as a well-recognized psychological consequence of falls affecting more than 60% of patients with multiple sclerosis (PwMS). FOF has even been indicated as a more disabling symptom than falling in PwMS. Most falls occur during dynamic movements, such as, walking in PwMS. In addition, deficits in motor control, including increased gait variability, might directly cause or worsen FoF by increasing gait unsteadiness. Therefore, the aim of this study was to compare the gait variability parameters between healthy controls and PwMS with high and low FOF.

Methods : This cross-sectional study examined gait variability in 40 PwMS and 20 age-and-sex-matched healthy controls during treadmill walking at preferred walking speed for 3 min. The falls efficacy scale-international questionnaire was used to stratify PwMS into high and low FOF subgroups. Gait variability was assessed using stride time variability, stride length variability, and swing time variability variables.

Results : For stride time and stride length variability, the mean values were significantly greater in PwMS with high ($p < 0.001$) and low FOF (p= 0.03 and p= 0.001, respectively) compared to healthy controls. The mean values of swing phase variability were significantly greater in both MS groups compared to healthy control ($p < 0.001$). In addition, PwMS with high FOF showed greater values of swing time variability compared to low FOF ($p = 0.01$).

Conclusion : Our results indicated that swing time variability could discriminate gait pattern alterations between PwMS with high and low FOF. These findings will contribute to better understanding the effect of FOF on gait performance in PwMS.

Keywords : Multiple sclerosis, Fear of falling, Gait, Variability.

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Determination of migraine headache frequency in multiple sclerosis patients

Submission Author: Nima Broomand lomer

Mandana Ashkan[1], Alia Saberi[2], Hamidreza Hatamian[2], Ali Ashraf[3], Enayatollah homayirad[4], Arash Bakhshi[1], Kasra Sarlak[1], Kamal AmirAshjei[1], Nima Broomand[1]

1. Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran
2. Department of Neurology, Poursina Hospital, Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran
3. Department of Anesthesiology, Poursina Hospital, Faculty of Medicine, Guilan University of Medical Sciences, Rasht, Iran

   1. 4. Social Determinants of Health Research Center, Guilan University of Medical Sciences, Rasht, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic disease of the central nervous system that is associated with gliosis, neurons demyelination and inflammation, eventually leading to plaque formation in various areas of brain and spinal cord. The prevalence of headache in MS patients is 28.8%, the most common of which is migraine. Paying attention to migraine and headaches of MS patients and their treatment can improve their quality of life. Therefore, we aimed to determine the frequency of migraine headache in patients.

Methods : This was a descriptive cross-sectional study that was performed among 125 MS patients and 125 controls with minor skin trauma referred to Poursina Hospital in Rasht in 2020 -2021. After obtaining written consent, all the subjects were asked to answer the questionnaire. Statistical analysis was done by SPSS software version 28.

Results : In this study 96 RRMS, 19 PPMS and 10 SPMS patients participated among which frequency of mild, moderate and severe disability was 74.4%, 22.4% and 3.2%, respectively. Migraine was diagnosed in 16 patients of the control group and 36 patients of the study group. The frequency of migraine in MS patients was significantly higher than the control group. (14.4% vs. 6.4%) (p = 0.002). There was a significant relationship between having or not having MS and migraine incidence (OR:2.76, P = 0.004).

Conclusion : In summary, MS patients experience migraine headaches approximately twice the general population.

Keywords : Multiple Sclerosis; Migrane; Headache

Count: 388
Abstract ID: 448
subject: Motor Systems
and Movement Disorders: Cerebellum and Basal Ganglia
Presentation Type: Poster

The effect of synaptic vesicle glycoprotein 2A inhibition on motor activity in methamphetamine-treated rats

Submission Author: Kiyana Khazaee

Kiyana Khazaee[1], Mohammad pour kargar H1[2]

1. Faculty of Pharmacy, Islamic Azad University, Damghan Branch, Damghan, Iran
2. Faculty of Pharmacy, Islamic Azad University, Damghan Branch, Damghan, Iran

Background and Aim : Synaptic vesicle glycoprotein 2A (SV2A) is a membrane protein specifically expressed in presynaptic vesicles and has important role in releasing of neurotransmitters. Levetiracetam (LEV), is a medication used for treating epilepsy. LEV is outstanding from other antiepileptic drugs due to its novel and main mechanism of action through the interaction with SV2A. Although, the main use of LEV is as an antiepileptic drug, other clinical applications such as an anti-hyperalgesic and anti-inflammatory, and in neuropathic pain have been tested, showing promising potential. In this study, preventive effect of the LEV on motor dysfunction in methamphetamine-induced neurotoxicity was investigated.

Methods : 35 male rats were allocated to 5 groups: 1) control, 2) methamphetamine, and three methamphetamine groups under treatment with LEV (17, 50 and 100mg/kg). Rats received methamphetamine repeatedly (4×10 mg/kg, 1 hour interval) and LEV was injected 30 min after the last methamphetamine injection. Rota road test was used for evaluation of neurobehavioral functions. The total test time was set to 300 seconds, and the rotation speed of rod was expedited from 4 rpm to 40 rpm. Comparison of experimental groups was performed by one way ANOVA followed by LSD post hoc test.

Results : Statistical analysis showed that injection of methamphetamine decreased rota-road time ($P<0.001$) significantly. Administration of LEV increased rota-road time at 50 mg/kg ($P<0.001$) and 100 mg/kg ($P<0.001$) respectively.

Conclusion : The present study showed that exposure to acute methamphetamine decreases motor coordination in rats. As the effects of methamphetamine in CNS are majorly dependent on interaction with norepinephrine and glutamate systems, it is possible that acute exposure to methamphetamine increases glutamate releasing in synaptic cleft, in which induces neurotoxicity

and neural death. It seems that LEV attenuates glutamate concentration in synapses and prevents neural death in basal ganglia or cerebellum and finally prevents from motor dysfunction in methamphetamine-treated rats.

Keywords : Methamphetamine, Levetiracetam, Motor activity

Count: 389
Abstract ID: 439
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

The effect of movement games on movement adaptation and visual perception in athletes with Parkinson

Submission Author: Afsaneh Mousaei

Afsaneh Mousaei[1], Fereshteh Amozadeh[2], Negin Karami[3], Seyedeh Reyhaneh hashemi[4]

1. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
2. Ph.D. in sport Psychology, Department of Motor Behavior and Sports Psychology, Faculty of Physical Education and Sports Sciences, University of Tehran, Tehran, Iran
3. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran
4. Department of Sports Sciences, Faculty of Literature and Human Sciences, Khorramabad, Iran

Background and Aim : Parkinson's disease is a brain disorder that causes unwanted or uncontrollable movements such as stiffness, and difficulty with balance and coordination. Symptoms usually start gradually and get worse over time. As the disease progresses, people may have difficulty walking and talking. This disease is very common among athletes, especially martial arts athletes. The aim of this study was to investigate the effect of movement games on movement adaptation and visual perception in athletes with Parkinson

Methods : 22 athletes with Parkinson 36-46 years old with an age average (37.18(4.16 years) voluntarily participated in the present study and were randomly divided into control and movement games groups (n=11 in each group). The movement games group underwent movement games for 8 weeks and 4 sessions per week, each session lasting 45 minutes. The control group didn't have any intervention. Motor adaptation and visual perception were evaluated using a visual motor coordination test (BEERY™ VMI) in pre-test, post-test, and follow-up. Statistical analysis was performed using SPSS software version 21. ($p<0.05$)

Results : Results of analysis of variance with repeated measures showed a significant and stable improvement of motor adaptation and visual perception in athletes with Parkinson in the experimental group. ($p=0.015$)

Conclusion : According to the results of motion games, it has a positive and significant effect on motor adaptation and visual perception of people with Parkinson. Therefore, this method can be used to improve the movement adaptation and visual perception of athletes with Parkinson.

Keywords : movement games, movement adaptation, visual perception, Parkinson

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Count: 390
Abstract ID: 267
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

The effect of curcumin nanoparticles on behavioral function in a rat model of traumatic brain injury.

Submission Author: Abdolreza Narouiepour

Abdolreza Narouiepour[1], Sajad Sahab Negah[2]

1. Department of anatomy, School of medicine, Iranshahr University of Medical Science, Iranshahr, Iran
2. Department of Neuroscience, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Despite a great amount of effort, the defects and disabilities following traumatic brain injury (TBI) remain one of the most important public health issues and concerns of communities around the world. Among different mechanisms involved in TBI, neuroinflammation links primary injury to secondary injury and is likely a driver of chronic progressive neurodegeneration. Encapsulation of therapeutics within nanoparticles (NPs) is one of the approaches that can improve site-specific delivery and bioavailability. To this point, due to the anti-inflammatory and neuroprotective properties of curcumin, the major active component of turmeric, this component was selected as an adjuvant agent in this study. Moreover, to improve the stability and permeability of curcumin into brain tissue, we used curcumin-loaded niosome nanoparticles (CM-NPs). Here, we show CM-NPs has the potential to improve functional recovery in a TBI model.

Methods : The structure of the CM-NPs was visualized by Transmission electron microscopy (TEM) and high-performance liquid chromatography (HPLC) was used to detect the presence of CM-NPs in brain tissue. Furtheremore, to find out the optimal concentration of CM-NPs, an in vivo study was designed. Thirty-six male Wistar rats (200 ± 20 g) were subjected to TBI and divided randomly into 4 groups. Several behavioral assessments, such as rotarod, modified Neurological Severity Scores (mNSS), and open field (OF) tests were performed in a 28-day period in all TBI-induced rats. One day after the injury, animals randomly received orally either CM-NPs (25, 50, and 100 mg/kg/day, n = 9) or vehicle (n = 9) for 10 days. Following fulfilling behavioral tests, the results were analyzed and compared.

Results : TEM image of CM-NPs showed particles with spherical morphology and an average size of 60 nm. The concentrations of CM-NPs in the brain for 25 mg/kg, 50 mg/kg, and 100 mg/kg were 0.382 ± 0.004, 0.434 ± 0.004, and 0.425 ± 0.004 μg/g, respectively. Furthermore, on the 25th day after the brain injury, the results indicated that the treated group with 50 mg/kg of CM-NPs stayed longer (237.83 s) on the rod than the treated group with 25 mg/kg of CM-NPs (181.57 s) and vehicle group (173.62 s) but in the rotarod test, there was no significant difference for mean latency to fall on the rod between groups. In addition, the mNSS score in the treated group with 50 mg/kg of CM-NPs was significantly decreased compared to 25 mg/kg of CM-NPs on day 7 after TBI ($P<0.05$). Also, the statistical analysis showed no significant difference for total distance traveled in the open field between groups.

Conclusion : Taken together, nano-drug delivery systems may have the potential to offer therapeutic availability and efficacy over usual treatment.

Keywords : Traumatic brain injury . Nanoparticle-based delivery . Behavioral function

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 391
Abstract ID: 37
subject: Motor Systems
and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia,
edication-induced Movement Disorders)
Presentation Type: Poster

Exploring the severity of non-motor symptoms in Parkinson's disease patients with type 2 Diabetes

Submission Author: Hamed Hajishah

Hamed Hajishah[1], Mohammdjavad Amini[2]

1. Student Research Committee, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran
2. Student Research Committee, Medical School, Alborz University of Medical Sciences, Karaj, Iran

Background and Aim : There is evidence supporting the hypothesis that there is a link between Parkinson disease (PD) and Diabetes. Researchers have found that these two diseases may share common genetic and biological mechanisms, particularly insulin signaling. In previous studies, more risk of PD in type 2 diabetes patients compared to healthy cases is observed. Also, PD patients with type 2 diabetes have demonstrated faster progression of motor symptoms than non-diabetic patients. This study investigates whether non-motor symptoms of PD are also affected by this link.

Methods : Data used to prepare this study was obtained from the Parkinson's Progression markers initiative(PPMI) database(https://www.ppmi-info.org/). Demography, Non-motor data (including SCOPA-AUT questionnaire for autonomic dysfunction, UPDRS-Part1, Montreal cognitive assessment, and Geriatric depression scale), and Blood chemistry data were downloaded from the PPMI website in August 2022 after acceptance for data accessibility. We first excluded all the healthy controls (in terms of PD), and then, based on WHO diagnostic criteria for type 2 diabetes and by using blood chemistry data (plasma glucose), we categorized PD cases into three groups: PD cases with diabetes (n=43), PD cases with pre-diabetes or controlled diabetes (n=100), and PD cases without diabetes (409). All the data manipulation was performed by Python programming language, specifically Pandas library. Group comparisons were performed using ANOVA analysis of variances and Chi-square test in accordance with the type of variables by IBM SPSS Statistics software for Windows, Version 26.0.

Results : First, we matched the demographic characteristics. Except for BMI ($p<0.001$), the other variables (including age, sex distribution, and ethnicity variations) did not show a significant difference ($p>0.05$). There was no difference in the UPDRS-Part1 total score between the

groups(p>0.05). In terms of SCOPA-AUT, we categorized scores into 4 groups: gastrointestinal, cardiovascular, Urine, and thermoregulatory. Then statistical analysis was performed on each group particularly and the total score as well. Despite a significant difference in thermoregulation score (p=0.033), the other groups and the total score did not show any significant differences (p>0.05). In the analysis of the Geriatric depression scale, there were no significant differences among the 3 groups (p>0.05). Finally, in the matter of Montreal cognitive assessment score, a significant difference was observed in the total score (p = 0.03) indicating more severe cognitive impairment in PD cases with diabetes.

Conclusion : To sum up, as was mentioned in the results section, there is controversy surrounding different non-motor assessments. Despite the majority of symptoms, it seems that cognitive impairment and thermoregulatory dysfunction are observed more severely. In general, we may not be able to reach an absolute conclusion. Further studies concentrated on PD cases with Diabetes are recommended.

Keywords : Parkinson's disease, type 2 diabetes, non-motor symptoms

Count: 392
Abstract ID: 332
subject: Motor Systems
and Movement Disorders: Other
Presentation Type: Poster

Status Migrainosus as the First Presentation of MS : a case report and review of literature

Submission Author: Samin Davoody

Samin Davoody[1], Mohammad Mahdi Rabiei[2], Mahtab Ramezani[3]

1. Student Research committee, School of medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Skull Base Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : MS is a chronic inflammatory illness that causes neuronal demyelination and axonal degeneration in the central nervous system. Symptoms of MS vary widely based on grades of sensory, motor, and cognitive dysfunctions. In this regard, headache is a common comorbidity that affects most patients; however, it is quite rare as the initial symptom of MS. As the first presentation, status migrainosus is even rarer.

Methods : Herein, we report a case of a 31-year-old woman with recently diagnosed MS who suffered from headache exacerbations, but had no revealing results in her neurological exams including Brain MRI, metabolic panel, inflammatory markers, and cerebrospinal fluid (CSF) analysis. At the beginning, intravenous (IV) methylprednisolone 1 g/d for 5-day administration successfully relieved the symptoms; however, during and after the 4-month follow-up, the non steroidal anti-inflammatory medications and triptans had almost no effect on the headaches. Since the headache was not responsive to symptomatic therapy, IV methylprednisolone was given for 3 days which dramatically ceased the symptoms. Additionally, a subsequent Brain MRI with and without gadolinium was requested. According to new T2-weighted lesions observed in her Brain MRI and clinical symptoms of headache, clinically definite MS was established, and glatiramer acetate was started. During 3 months of follow-up receiving glatiramer acetate, no episode of headache has occurred.

Results : This case demonstrates the possible relationship between migraine and MS in newly diagnosed patients. Migraine could be associated with periventricular MS plaques; however, the role of these lesions on the pathophysiology of migraine is still unclear. We identified only seven

published case reports, all of which had presenting symptoms of migraine headaches. As demonstrated, only one adult patient had status migrainosus that had midbrain demyelinating plaque.

Conclusion : Although headache as the single manifestation of an MS attack is unusual, new-onset headaches, a change in the pattern of previous episodes, and unsatisfactory responses to established therapy regimens should be considered carefully , and demand additional evaluation.

Keywords : Migraine disorders, Headache, Multiple sclerosis, Treatment outcome

Count: 393
Abstract ID: 283
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

Evaluation of antiangiogenic effects of intranasal Sunitinib delivery in improving glioblastoma rat models

Submission Author: Elham Seidkhani

Elham Seidkhani[1], Fatemeh Moradi[2], Mohammad Taghi Joghataei[3], Soraya Mehrabi[4]

1. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
4. Department of Physiology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Glioblastoma (GBM) is the most malignant and vascular solid tumors in adults, which originates from glial cells. Currently, the first line of drug treatment for GBM is temozolomide (TMZ), which causes DNA alkylation. However, resistance to treatment is observed in at least 50% of patients treated with TMZ. One of the critical biological elements responsible for progression of cancers such as GBM is angiogenesis. Blood vessels in tumors are used for nutrient delivery and migration of cancer cells. Recently, inhibitors of angiogenic growth factors especially vascular endothelial growth factors (VEGFs) and their receptors have been widely considered as anticancer drugs. Sunitinib (STB), a small molecule with strong anti-tumoral and anti-angiogenic effects, can block multiple tyrosine kinase receptors involved in angiogenesis, such as VEGF receptors. Due to the presence of blood brain barrier (BBB), drug delivery to the brain is another challenge in the treatment of brain tumors such as GBM. Intra nasal (IN) drug delivery is noticed to be a desirable route for direct delivery of drugs to the brain and many researchers have proposed that this method bypasses the Blood Brain Barrier (BBB). In IN approach, drug is delivered to the brain through the olfactory and the trigeminal nerves. Another benefit of IN delivery is the elimination of the first-pass metabolism of the drug, thus preventing drug-induced hepatotoxicity. Since oral (OR) administration of STB causes hepatotoxicity and according to the benefits mentioned about IN delivery, in the present experiment, this method was selected for STB delivery to the brain and compared with its OR delivery method.

Methods : In vitro, glioma cell line was cultured in medium. To assess the viability of these cells after treatment with STB, the MTT assay was used. In vivo, 32 male Wistar rats were purchased. The animals were randomly placed into four groups: In the OR-treat and IN-treat groups, GBM-

bearing rats received 15 mg/kg/day STB orally and intranasally, respectively. Whereas, in OR-sham and IN-sham groups, GBM-bearing rats received sterile water as a placebo orally and intranasally, respectively. For GBM implantation, glioma cells were injected intracranially and tumor formation was confirmed with MRI after 14 days. GBM rat models were treated with OR and IN sunitinib administration. At the end of the study, the tumor size, expression levels of angiogenesis markers, and hepatotoxicity measured in different groups were compared.

Results : The viability percentage in cells receiving different doses of sunitinib was significantly lower than the control group. The findings of MRI revealed that the tumor volume in OR-treat and IN-treat groups significantly decreased compared to their respective sham groups. The result of immunohistochemistry indicated that VEGFR2 and CD31 expression in the tumor site significantly decreased in IN-treat and OR-treat groups compared to sham groups. Based on our biochemical and histological findings it appears that IN delivery of sunitinib is safer than OR delivery.

Conclusion : The findings of the present research showed that intranasal delivery of sunitinib exhibits inhibitory effects on GBM tumor volume and angiogenesis and manifests safety in terms of hepatotoxicity.

Keywords : Glioblastoma; Intranasal delivery; angiogenesis; antiangiogenic drug

Count: 394
Abstract ID: 350
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

A case report about a patient with left occipital tumor

Submission Author: Zahra Mohammadi

Zahra Mohammadi[1]

1. BSN of nursing of Alborz university of medical science ,Alborz,Iran

Background and Aim : The patient, a 52 years old man with severe lasting headache for 10 days as chief complaint and left occipital brain tumor as diagnose .after doing brain Ct scan he transferred to a hospital in karaj for surgery treatment.

Methods : this article is a case report one about a middle aged man with brain tumor and severe lasting headache .

Results : the patient has no underlying disease, no usage of specific drug and no sensivity to drugs. the results of laboratory tests was normal. and also the examinations was normal .the patient has no family history about brain tumors.

Conclusion : the process of surgery was successful .and the biopsy of tumor tissue sent to the pathology center for more research .the patient passed about 5 days after surgery in intensive care unit and then in neurosurgery ward for more controls and taking more care.

Keywords : brain tumors, integrative system, occipital cysts,neurosurgery

Count: 395
Abstract ID: 338
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

A case report about a patient with right middle fossa brain tumor probably epidermoid

Submission Author: Zahra Mohammadi

Zahra Mohammadi[1]

1. BSN of Nursing of alborz University of medical science, Alborz, iran

Background and Aim : The patient, a 35 years old man, with a history of vertigo and neusea and balance disorder(ataxia) from three months ago. According to the history of drug use, patient is undergoing addiction treatment that there is no improvement in the patient's symptoms and sign. and symptoms and signs get worse and patient has a headache and blurred vision in last weeks while walking in the street, The patient loses consciousness and then falls.

Methods : The article is a Case report one and is about a young man with brain tumor that refers to hospital in karaj for surgery treatment.

Results : The patient is transferred to Shahid rajaei hospital and after performing the initial measures he is transferred to Madani hospital in karaj with low consciousness for surgical treatment. The patient had a seizure attack at 8 years old and also has speech disorder and mental retardation. He uses sodium valproat and phenobarbital drugs. He answered the question with brain movements.

Conclusion : The operation of removing tumor was successful and the pathology sample also sent to the pathology center for more research. The patient passed a week after surgery in hospital for more controls first in intensive care unit and then in neurosurgery ward.

Keywords : Brain tumor, neurosurgery, integrative system, epidermoid cyst

Count: 396
Abstract ID: 25
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

Evaluation of the effect of Staphylococcus aureus cytoplasmic extract on U87 glioblastoma cell line and evaluation of the expression of apoptotic bax and bcl-2 genes

Submission Author: Maryam Rasouli

Maryam Rasouli[1], Bahareh Hajikhani[2], Hossein Fahimi[3]

1. Department of Genetics, Faculty of Advanced Science and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
2. Department of Microbiology, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Electronic address: hajikhani@sbmu.ac.ir.
3. Department of Genetics, Faculty of Advanced Science and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

Background and Aim : Glioblastoma is one of the most common malignant diseases that develop in the spinal cord or brain, and its prevalence rate in Iran is faster than the global statistics of a decade and is one of the most serious causes of death in patients. So far, many treatment methods have been used for treatment, but these methods were transient, there was still a possibility of disease recurrence and they did not have a good effect on the patient's survival.In recent years, drugs such as bacterial toxins, different fractions, and cytoplasmic extracts have received attention in the treatment of various types of cancers. Therefore, the purpose of this study is to evaluate the effect of Staphylococcus aureus cytoplasmic extract and its function on U87 glioblastoma cell line and its effect on apoptosis induction.

Methods : U87 cell line cells were produced from Iran's teak reserves center and the cells were grown in suitable conditions. Staphylococcus aureus was also cultured in LB Broth at 37 degrees for 24 hours; Then, plant cytoplasmic extract was prepared by sonication and its contents were evaluated by SDS-PAGE. Lowry's method was used to determine and finally, the inhibitory effect of Staphylococcus aureus on cell proliferation and apoptosis was investigated through MTT test. The tumor cell was treated with an ideal dose of Staphylococcus aureus extract, and the expression rate of bcl-2 and bax genes was measured using Real-Time-PCR techniques.

Results : Cytoplasmic extract of bacteria prevented the continuation of the proliferation process in U87 cell line and induced apoptosis by increasing the expression of apoptotic gene bax and decreasing the expression of bcl-2 gene. In fact, based on the analysis performed between the case

and control groups by means of a statistical test, it is observed that the expression of bcl-2 in the treatment cDNA cell based on the CT ranking is lower than the control group with a significant difference in variance, and also the expression of the bax gene in a sample of has been treated Attention to the CT rate is higher than the control group (P Value < 0.05).

Conclusion : These results proved that the cytoplasmic extract of Staphylococcus aureus has an inhibitory effect on proliferation in the U87 cell line, and by implementing more projects in the direction of identifying bacterial substances with anticancer properties, Staphylococcus aureus extract can be used. It has been named as a favorable candidate for inducing apoptosis in malignant tumors

Keywords : Glioblastoma, Staphylococcus aureus, apoptosis, cell proliferation, U87 cell line

Count: 397
Abstract ID: 9
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Deep Learning and Neuroscience: Toward Integration

Submission Author: Milad Vazan

Milad Vazan[1]

1. Department of Computer Science, Faculty of Mathematics, Statistics, and Computer Science, University of Tabriz, Tabriz, Iran

Background and Aim : An important machine learning technique is deep learning, which uses Artificial Neural Networks (ANNs) to learn how to do what humans do naturally. In ANNs, the integration and activation properties of real neurons are modeled by basic units. In order to uncover general principles underlying neural system function, deep learning concepts have been combined with neuroscience theories. The theories of the brain can be better understood by deep learning, according to several studies. Due to the fact that deep neural networks learn from experience, and not from the human endowment, this approach has the potential to radically reshape the way we approach understanding neural systems.

Methods : The present study reviewed studies related to integrating neuroscience and deep learning.

Results : Our efforts should be directed toward two areas in order to have a broad impact on deep learning in neuroscience. Bringing artificial neural networks closer to neurobiology is the first step. Second, we should endeavor to "open the black box" to explain how it works and the reason for its predictions and outputs. A better understanding of how this black box works may provide a better insight into how the brain works in activities and behaviors.

Conclusion : Research in neuroscience is increasingly using deep learning, and deep learning has positive effects on neuroscience. We are learning more about brain functions through deep learning, which is increasingly being utilized for neuroscience research.

Keywords : Deep Learning; Artificial Neural Networks; Neuroscience

Count: 398
Abstract ID: 221
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Improving Performance of Neural Spike Data Compression Using Denoising Autoencoders

Submission Author: Nazanin Ahmadidastgerdi

Nazanin Ahmadidastgerdi[1], Hossein Hosseini-Nejad[2]

1. K. N. Toosi University of Technology
2. K. N. Toosi University of Technology

Background and Aim : Advances in Neural recording microsystems enabled the neuroscientists to capture spike data from different regions of the brain. Understanding the recorded brain activity is a critical step towards diagnosis and treatment of brain disorders such as Parkinson's disease and epilepsy. However, wireless transmission of the entire recorded data can be an issue due to the limited bandwidth. To tackle this problem, neural data compression approaches are employed. They reduce the bandwidth usage at the cost of lowering signal quality. This paper reports a novel method based on Denoising Autoencoders (DAEs) to improve the quality of the reconstructed neural signal.

Methods : The spike data is first compressed using Vector Quantization (VQ), which is a well-known compression approach allowing high compression ratios as well as acceptable signal reconstruction quality. It maps the input data to a finite set of code-vectors and encodes each input vector with the index of its corresponding code-vector. Then, the reconstructed data is fed into the DAE which is trained using decompressed and original spike waveforms. In the training phase of the Denoising algorithm, the decompressed spikes and original spikes are employed in input and output layers, respectively. As a result, it learns how to reconstruct the original spike waveforms from the corrupted data, resulting in improving the reconstructed spike quality.

Results : To measure the compression performance, we employed the Signal to Noise and Distortion Ratio (SNDR). It quantifies the error between the original and reconstructed spikes. Using DAE, we achieved an average increment of 2dB in SNDR which is a noticeable improvement in signal reconstruction quality.

Conclusion : Spike compression is a vital procedure in wireless monitoring of the recorded neural data, while it may cause quality reduction in the reconstructed data. In this paper, we show that Denoising the reconstructed data with Autoencoders can be a promising approach for rising the compression performance.

Keywords : Spike Compression; Vector Quantization; Denoising Autoencoders

Count: 399
Abstract ID: 309
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

A spike sorting algorithm using event-based feature extraction and scoring classification

Submission Author: Fereshteh Kalantari

Fereshteh Kalantari[1], Hossein Hosseini-Nejad [2], Amir M. Sodagar [3]

1. Faculty of Electrical Engineering, K.N. Toosi University of Technology, Tehran, Iran
2. Faculty of Electrical Engineering, K.N. Toosi University of Technology, Tehran, Iran
3. Faculty of Electrical Engineering, K.N. Toosi University of Technology, Tehran, Iran

Background and Aim : In basic and clinical neuroscience research, extracellular recording plays an important role to study the information processing mechanisms within the nervous system which are beneficial in applications like brain-machine interfaces (BMIs), neural prosthetics, treating of neural disease such as Epilepsy, Parkinson and so on. To analysis extracellular neural activities, action potentials (spikes) are needed to distinguish from others which is called "spike sorting". The spike sorting algorithms generally consist of spike detector, feature extractor and classifier. In this paper, a new spike sorting algorithm is proposed using event-based feature extraction and scoring classification. Fulfilling efficient implementation requirements in terms of low hardware complexity and real-time operation, the proposed approach is suitable for use in implantable BMIs.

Methods : In the proposed event-based feature extraction method, the samples of the spike are widowed using moving windows. Then the slop sign in each window is calculated by comparison of middle sample with previous and next samples. The feature of the middle sample will be 1 when the slop of the middle sample is positive compared to the previous and the next samples. On the contrary, the feature will be -1 when the slop is a negative. In the following, if the middle sample is placed in extreme, the zero is assign as the feature. In this way, every sample of the spike is converted to the event-based features using the slop sign which these events are 1 or 0 or -1. On the other words, these simple features can be classified by a simple classification algorithm to achieve a high classification accuracy. The proposed scoring classification is used to assign the spikes to their individual neuron. So that, the score of the detected spike (Si) with each centroid (C1, ..., CK. K is the number of the neurons) is computed. In this method, the feature of the spike is compared with the corresponding feature in the centroid, the score is increased by one when the two features are the same. But the score is decreased by one when the two features are not the zero

and the same. The total sum of score is calculated as the score of the under-study spike and each centroid, separately (scorei1, …, scoreiK). Then the largest score determine the ID of this spike.

Results : Performance of the proposed algorithm was evaluated by Wave_Clus dataset with a different range of Noise Levels (0.05, 0.1, 0.15 and 0.2). The average classification accuracy of proposed method is 95% while the accuracy using the samples of the spike as the features was 93%. In the proposed feature extraction method, 8bit samples are transferred to 2bits features which provides a data rate reduction up to 75% as well as significantly reduction in computation complexity.

Conclusion : In this paper, an online spike sorting algorithm with low computational complexity in both feature extraction and classification methods was proposed. This algorithm presents high accuracy and is promising for on-chip hardware implementation with low power consumption and small silicon area which are crucial for implantable BMIs.

Keywords : Spike sorting; event-based feature extraction; scoring classification; implantable BMIs

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Policicosanol protects against Alzheimer's disease-associated spatial cognitive decline in male rats: Possible involved mechanisms

Submission Author: Samaneh Safari

Samaneh Safari[1], Alireza Komaki[2], Naser Mirazi[3]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan 65178/518, Iran
2. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan 65178/518, Iran
3. Department of Biology, Faculty of Basic Sciences, Bu-Ali Sina University, Hamedan, Iran

Background and Aim : Alzheimer's disease (AD) is a chronic neurodegenerative disorder characterized by cognitive decline and synaptic failure. The present study was designed to explore the possible protective effects of policosanol (PCO) on spatial cognitive capacity, long-term potentiation (LTP) induction, oxidant/antioxidant status, and Aβ plaques formation in an AD rat model induced by intracerebroventricular (ICV) injection of Aβ1-40.

Methods : Healthy adult male Wistar rats were randomly divided into control, sham (ICV injection of 5 μl phosphate-buffered saline), AG (50 mg/kg; P.O., as PCO vehicle), PCO (50 mg/kg; P.O.), AD model (ICV injection of 5 μl Aβ), AD + AG (50 mg/kg; P.O.), and AD + PCO (50 mg/kg; P.O.). Treatments were performed for eight consecutive weeks. At the end of the treatment course, spatial learning and memory functions, hippocampal long-term potentiation (LTP) induction, malondialdehyde (MDA), and total thiol group (TTG) levels, as well as the formation of Aβ plaques were examined.

Results : The results showed that injection of Aβ reduced spatial learning and memory abilities in the Barnes maze test, which was accompanied by decreases in field excitatory postsynaptic potential (fEPSP) slope, population spike (PS) amplitude, and TTG level and increases in Aβ plaque accumulation and MDA content. In contrast, PCO treatment improved all the above-mentioned changes in the Aβ-infused rats.

Conclusion : The results suggest that amelioration of hippocampal synaptic plasticity impairment, modulation of oxidant/antioxidant status, and inhibition of Aβ plaque formation by PCO may be the mechanisms behind its protective effect against AD-associated spatial cognitive decline.

Keywords : Policosanol; Alzheimer's disease; Barnes maze test; Long-term potentiation; Amyloid-beta

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Count: 401
Abstract ID: 285
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Image Processing Methods in Prediction & Detection the Lesions of Brain Stroke

Submission Author: Sogand Abbasi Azizi

Fatemeh Hamidi[1], Sogand Abbasi Azizi[2], Dr. Ali Khanzadeh Moghaddam[3]

1. Student Research Committee, Kermanshah University of Medical sciences, Kermanshah, Iran.
2. MSc. of Anatomical Sciences,Student Research Committee, Kermanshah University of Medical sciences, Kermanshah, Iran.
3. MD Radiologist, Department of Radiology, Shahid Beheshti Hospital, Abadan University of Medical Sciences, Abadan, Iran.

Background and Aim : The brain is the most complex organ in the human body, which comprises the cerebrum, cerebellum and brainstem. Stroke , a medical emergency that occurs due to interruption of flow of blood to a part of brain because of bleeding od blood clots and is the world's second-leading cause of mortality. Early detection of a brain stroke can help to prevent or lessen the severity of the stroke. The variety ways of diagnosis is focusing on neuroimaging techniques, such as computed tomography (CT) or magnetic resonance imaging (MRI), allows one to confirm brain stroke diagnosis and determine the location and the number of lesions. The purpose of this study was to design and introduce a diagnostic software for that in MRI images.
Methods : This research was a software designing study that many MRI images that used in the past articles were analyzed with the software designer. The designed software was in MATLAB . In this study ; we used image processing techniques such as ; noise removing , edge denotation , separate of area with high density and contrast increasing for analysis ,evaluating of output histogram . Based on the evidences from this analysis, radiologist could have the best diagnosis of the lesions. The results of all lesion diagnostics were analyzed .
Results : Designed software enables the present MRI images analyzes them pixel by pixel and histogram. This software in addition evaluates the areas of lesions and shown them without viewer diagnosis completely . Final results of diagnostic software analysis showed high sensitivity .
Conclusion : Contemporary assessments of morphological and physiologic traits of lesions by a computer aided diagnostic software can improve the radiologist's precision and decrease reading time of bulk images of MRI. Using this software to increase the accuracy of the lesions detection and early identification of acute stroke for initiating prompt intervention to reduce morbidity and mortality, is suggested.
Keywords : Brain Stroke; Image Processing; MRI Images

Count: 402
Abstract ID: 213
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Identification of hub genes and pathways in Parkinson's disease by bioinformatics analysis

Submission Author: Fereshteh Golab

Fereshteh Golab[1]

1. Cellular and Molecular Research Center, Iran University of Medical Science, Tehran, Iran.

Background and Aim : The substantia nigra is frequently implicated in Parkinson's disease, which is one of the most common diseases in the aged population; however, the signaling pathways and linked genes underlying Parkinson's disease are unknown.

Methods : This study took integrated bioinformatics analysis with two expression datasets GSE8397 and GSE22491, downloaded from Gene Expression Omnibus (GEO) database were included post mortem brain tissue and peripheral mononuclear blood samples from Parkinson's disease and control cases respectively. Differentially expressed genes (DEGs) were filtrated under the condition of both p-value < 0.05 and [log2FoldChange (log2FC)] > 0.5. Then, gene ontology (GO) and Kyoto encyclopedia of genes and genomes enrichment (KEGG) analysis, and protein–protein interaction (PPI) network construction were utilized to further explore these DEGs.

Results : Nine common downregulated DEGs were identified as being linked to Parkinson's disease. With significant enrichment analysis that encompassed metabolic pathways, the DEGs were grouped based on function and signaling pathway.

Conclusion : We identified prospective genes and pathways in Parkinson's disease using bioinformatics analysis, which might increase our understanding of underlying molecular processes and serve as possible treatment targets for Parkinson's disease.

Keywords : Parkinson's disease; hub genes; pathways; bioinformatics analysis

Count: 403
Abstract ID: 161
subject: Computational Neuroscience: VR and AR
Presentation Type: Poster

The Effect of Virtual Reality on Reducing Pain and Anxiety After Cesarean Section

Submission Author: Maryam Vafaei Sefti

Maryam Vafaei Sefti[1], Zohreh Khosravi[2], Leila Cheragh Mollaei[3], Ladan Kashani[4], MohammadReza Oshaghi[5]

1. Department of Psychology, PhD student of Education and Psychology, Shahid Beheshti University, Tehran, Iran
2. Department of Psychology, Faculty of Education and Psychology, Alzahra University, Tehran, Iran
3. Department of Psychology, Faculty of Education and Psychology, Alzahra University, Tehran, Iran
4. Department of Obstetrics and Gynecology, Arash Hospital, Tehran University of Medical Sciences, Tehran, Iran
5. Department of Mechanical Engineering, PhD Graduate of Mechanical Engineering, Sharif University of Technology, Tehran, Iran

Background and Aim : Postoperative pain and anxiety after cesarean section can make one of the best moments of a woman's life, that is child birth, difficult leaving with bad memories. The conventional method to reduce the pain and anxiety after caesarean section is drug interventions. But today, the reduction of painkillers is one of the public health concerns, and this is even more important in mothers due to the possibility of drug transfer from breast milk to the newborn. One of the nonpharmacological interventions to reduce pain and anxiety is virtual reality. The purpose of this study was to investigate the effect of virtual reality on reducing pain and anxiety after cesarean section.

Methods : In this study, a quasi-experimental research method was used with a pre-test-post-test design with a control group. The statistical population was the mothers who underwent caesarean section in Arash Hospital in Tehran. 35 people were selected using the purposeful sampling method. The participants were placed in two groups of virtual reality (17 people) and control (18 people) by their own choice. A demographic information form was filled out for the participants. The time of the intervention was the first time to walk after cesarean section. Before and after walking, the amount of pain and anxiety was measured using a visual analog scale, and blood pressure and heart rate were measured using a sphygmomanometer, and the duration of walking was also measured using a stopwatch. The intervention group put the virtual reality headset on their face and walked in the simulated environment.

Results : Data were analyzed using SPSS software version 26. The results showed that the virtual reality intervention significantly reduced pain and anxiety and significantly increased the duration of walking after cesarean section.

Conclusion : As a result, it can be claimed that virtual reality is an effective and applicable non-pharmacological method to reduce pain and anxiety after cesarean section.

Keywords : cesarean; postoperative pain; virtual reality

Count: 404
Abstract ID: 462
subject: Neurorehabilitation and Regeneration: Occupational Therapy
Presentation Type: Poster

Occupational Therapy in a Child with Joubert Syndrome

Submission Author: Sedigheh Ganji Harsini

Sedigheh Ganji Harsini[1]

1. Ph.D. student, Department of cognitive Neuroscience, University of Tabriz

Background and Aim : Joubert Syndrome (JS) is rare genetic heterogeneously inherited neurodevelopmental disorder, which was identified in 4 siblings for the first time in 1969 by Joubert et al. It is characterized by the absence or underdevelopment of the cerebellar vermis (a part of the brain that controls balance and coordination) and a malformed brain stem (connection between the brain and spinal cord).

Methods : When reviewing literature, no results of an occupational program supporting the motor development of the children with JS were available. In this study, it was aimed that the process of an occupational therapy in 5-year old case with JS be shared. The aim of this study presents the results of the 5-year-old occupational therapy process in case with JS.

Results : The 5-year-old male case was born at term, 3050?gr weight, by normal delivery. That was the first gestation and first delivery of the mother. The mother in question had no serious disease throughout his pregnancy. There is no kinship between the mother and the father. There is nobody else within the family who has this anomaly.

Conclusion : The case was diagnosed with JS when he was 18 months old. JS is a rare autosomal recessive disorder characterized by cerebellar vermis hypoplasia

Keywords : joubert syndrome occupational therapy

Count: 405
Abstract ID: 431
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Poster

Re-learning lost vocabulary in Logopenic Progressive Aphasia: A single-subject study

Submission Author: Salimeh Jafari

Salimeh Jafari[1]

1. Rehabilitation Faculty , Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Primary progressive aphasia (PPA) refers to a group of neurodegenerative disorders that slowly and progressively impairs language network while other aspects of cognitive processing such as memory, attention, visuospatial skills, and executive functions remain unaffected in the initial stages of the condition. Originally two subtypes, the semantic variant and the nonfluent/agrammatic variant, were described, but more recently it has been recognized that there are further subtypes the logopenic variant of PPA (lvPPA). Patterns of brain degeneration in Logopenic subtypes of PPA are perisylvian cortex in the left hemisphere, a region implicated in phonological processes critical to the comprehension and production of language and temporoparietal component of the dorsal pathway. lvPPA is characterized by impaired sentence repetition and word retrieval difficulties. anomia is the first and debilitating defect and symptom of lvPPA. In fact, according to degraded language networks, is it possible to re-learn lost words? The objectives of this investigation were to examine the ability of PPA individuals to relearn lost words.

Methods : One individual with PPA (HM) participated in this ABAB single-subject interventional study. HM was a 60-year-old man with a 4-year history of word finding difficulties following Frontotemporal dementia. She received 16 sessions of naming treatment over an eight-week period. The participant completed three baselines prior to treatment. The treatment used a phonological component analysis (PCA) (four weeks, two times a week) (A), followed by a self-monitoring (four weeks, two times a week(B). The main outcome was the naming ability assessment score administered 10 times in order to examine the effectiveness of the therapy through statistical analysis. To examine maintenance/generalization of the PCA phase. After completing the first phase and the break period, the participant then underwent a second phase of integrated therapy (A) with the same duration as the first phase. After that, there were two break weeks as a follow-up phase (B). The study design involved repeated assessments made at weekly intervals, three times before treatment in order to provide the baseline status (before treatment) and once immediately following each four-week long treatment phase. The 150 line-drawings

pictures were used in treatment; they were applied as a measurement tool for tracking the change of naming ability during the intervention. Correct answers were scored as 1 and no answer or non-target response was scored as 0, to increase the experimental control. The design also included the assessment of items treated in the therapy period and a matched set that was untreated. It should be mentioned here that the assessor was the same person who provided the intervention programs; so, she was not blind to the intervention allocation.

Results : The participant showed a significant improvement in the word retrieval ability in all stimuli and each set separately related to the therapies phases (P < 0.001).

Conclusion : Generally, without considering the type of therapy during this study, in spite of the progressive nature of the disease, word retrieval ability of the patient improved the generalization of untreated items and maintenance of treated items also were occurred to some extents.

Keywords : language network, Primary Progressive Aphasia, Lost word, Word retrieval intervention

11th Basic and Clinical Neuroscience Congress 2022
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Count: 406
Abstract ID: 3
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Poster

The effect of metabolic disease caused by hyperammonemia on language disorders and swallowing disorders in children: a case report and narrative review of literature

Submission Author: Shamim Ghazi

Shamim Ghazi[1], Toktam Maleki Shahmahmood [2], Fatemeh Haresabadi[3]

1. Department of Speech Therapy, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran
2. Department of Speech Therapy, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran
3. Department of Speech Therapy, School of Paramedical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Present research aimed to identify and highlight the impact of the metabolic disease caused by hyperammonemia on language and feeding skills of a 2.5-year-old girl diagnosed with hyperammonemia.
Methods : The study process was determined as a case study in line with this objective. The research was designed on the girl with a 1-year history of sudden-onset metabolic disorder with the manifestations of swallowing, speech and language disorders. Early language (comprehension and expression), and feeding problems were assessed through interviews with her mother. Formal and informal tests/measures were used to assess language and feeding skills of the child in two different times after the occurrence of the first symptoms. Comparative method among a case report and narrative review of literature was employed.
Results : This report presents a new and unique case of a child, with very high ammonia levels and severe clinical manifestations of cognitive, language and motor dysfunctions. Although the child had not received any direct interventions during the course of study, the secondary assessment revealed very slight improvements in some language or oral motor skills, probably due to maturation and advices provided by the rehabilitation team.
Conclusion : Metabolic disease caused by hyperammonemia is an uncommon and devastating disorder with impact on all life domains for child and family caregivers. Because children and adolescents with metabolic syndrome and hyperammonemia are at greater risk for other diseases, including nutritional problems and cognitive impairments, it is important to pay attention to the rehabilitative evaluation and treatments following the onset of the disorder.
Keywords : hyperammonemia, metabolic disease, language disorder, speech disorder, swallowing, feeding problem

Count: 407
Abstract ID: 16
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Poster

Evaluation of the effectiveness of intensive rehabilitation on aphasia after stroke

Submission Author: Elnaz Daneshpazhouh

Elnaz Daneshpazhouh[1], Fatemeh saadat[2], Kosar ghaedi[3]

1. Graduated Student, Department of Speech Therapy, school of rehabilitation sciences, Ahvaz Jundishapur University of Medical science, Ahvaz, Iran.
2. M.Sc. Student, Department of Speech Therapy, school of rehabilitation sciences, Ahvaz Jundishapur University of Medical science, Ahvaz, Iran.
3. Graduated Student, Department of Speech Therapy, school of rehabilitation sciences, Ahvaz Jundishapur University of Medical science, Ahvaz, Iran.

Background and Aim : Aphasia as a language disorder causes extensive damage to patients communication and language skills and is directly related to patients' quality of life; That is why the treatment of this disorder is really important. So far, studies have shown conflicting results regarding the results of post-stroke aphasia treatment. Since the compactness of the treatment plan was low in the studies that had negative results and the studies that had positive results were higher in compression, it is understood that this discrepancy in the therapeutic results is related to the compactness of the treatment sessions. Therefore, in the present study, the relationship between the effectiveness of aphasia treatments and the intensity of treatment sessions is investigated.

Methods : This study is a review of studies published between 2010 and 2021. The primary search sources are Pubmed, Google Scholar and Science Direct. Citation search has been used to find more relevant articles.

Results : However the most effective treatment for aphasia has not yet been identified; research confirmed the effectiveness of language therapy. Studies in this area show that the amount of therapeutic exercise has a significant effect on neuroplasticity of the brain after stroke. Also, based on the available evidence, therapeutic interventions that have held intensive therapy sessions over shorter periods of time (for example, 5 hours per week for a week) are more effective than studies that have intensive sessions (for example, 2 hours). Per week for 22 weeks) have been held. Numerous studies have proven the effectiveness of intensive therapies. According to these studies, these treatments have had significant effects on patients' perceptual and expressive skills.

Conclusion : Generally, aphasia can be introduced as a disorder that causes the loss of the ability to communicate verbally or the inability to understand verbal or written communication, the treatment of which is very important. Evidence supports the effectiveness of intensive therapies and suggests that intensive therapies improve speech and language rehabilitation outcomes in the short term; But the length of treatment and the hours of treatment offered per week that maximize recovery still need further investigation. It is hoped that this study will motivate researchers to do more research in this area.

Keywords : Aphasia;intensive therapy;strok;language therapy.

Count: 408
Abstract ID: 101
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

The inhibitory effects of BMP4 and p21 SiRNA complexes with Exosome on Wnt signaling Pathway and SH-SY5Y neural stem cell differentiation

Submission Author: Nayer Seyfizadeh

Nayer Seyfizadeh[1], mehdi farhoudi[2]

1. neurosciences research center, Tabriz university of medical sciences, Tabriz, Iran
2. neurosciences research center, Tabriz university of medical sciences, Tabriz, Iran

Background and Aim : Exosomes are nano-carriers containing proteins and microRNAs which can be secreted from the majority of cells. Our main goal in this study was to investigate the efficiency of exosomes in effective delivering siRNAs targeting P21 and BMP4 in to SH-SY5Y cells.

Methods : : Exosomes were isolated from SH-SY5Y cells' supernatant by using ultracentrifuge based protocols and they were loaded with test siRNAs using ExoFection kit. Afterwards, the effect of siRNAs targeting P21 and BMP-4 on the expression of genes, BMP-4, P21, NeuroD1 and Prox1 in SH-SY5Y cells were assessed by western blot and Real Time PCR.

Results : Exosomal markers (CD63 and CD9) were confirmed by Flow cytometry . Exosomes' size was estimated 49.23 ± 8.43nm by using DLS. Our data showed that exosomes' cytotoxicity in comparison to Lipofectamine were significantly low. Evaluation of gene expression showed significant increase in Neuro D1 and ProX1 expression level

Conclusion : Our data showed that siRNAs targeting P21 and BMP-4 were efficiently delivered with low cytotoxicity via exosomes and exosomes played an important role as carrier in SH-SY5Y cell differentiation toward neurons. It seems, this study is practical for treatment of some neurodegenerative diseases, but it needs more clinical investigations.

Keywords : Exosome; Differentiation; western blot; Flow cytometry; SiRNA

Count: 409
Abstract ID: 297
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

A review on Stem cell therapy in Neurodevelopmental disorders focused on Autism spectrum disorder

Submission Author: Nooriyeh Garaei

Nooriyeh Garaei[1], Omid Talebloo[2]

1. Department of cell therapy, Motamed cancer institute, Tehran, Iran
2. Alborz university of medical science, Alborz, Iran

Background and Aim : Autism spectrum disorder (ASD) is a heterogeneous neurodevelopmental disorder that includes problems in social communication, repetitive behaviors and sometimes speech disorders. The prevalence of autism in different countries has different rates, but according to the Center for Disease Control and Prevention (CDC), one out of every 59 children in the United States has autism. Until now, all the causes of autism have not been identified, but it is clear that this disorder is multifactorial and genetic and epigenetic factors play a prominent role in its occurrence. Autism treatment approaches are divided into cognitive-behavioral, nutritional, and medical methods, but still a specific treatment method with high efficiency for autism has not been identified. Today, treatment with the help of stem cells is considered one of the most promising and reliable methods in the science of molecular medicine and personalized medicine. According to specific immune and neurological disorders identified in patients with ASD, stem cell therapy and especially mesenchymal stem cells (due to their high anti-inflammatory properties) can be one of the unique tools to improve this kind of disease.

Methods : In this review article, Autism and mesenchymal stem cell therapy, autism and stem cell therapy keywords had been searched in the article databases of Google Scholar, Scopus and PubMed, focusing on researches in the clinical trial phase, and finally 7 articles were extracted that were in line with the keywords. At the end, one article had been retracted by PubMed database and it was excluded from the study.

Results : Totally, in these studies, the effects of injecting stem cells such as human cord blood mononuclear cells, autologous umbilical cord blood, umbilical cord-derived mesenchymal stem cells, Fetal Stem Cell, autologous bone marrow stem cell and bone marrow mononuclear cell had been studied on 194 autistic children. the amount of changes in children's cognitive behavioral levels has been measured using tests such as CARS, ABC, CGI, ATEC, VABS-II, PDDBI, EOWPVT-4, GARS-II, Behavior Assessment for Children-Social Skills subscale, Sensory

Experiences Questionnaire, Repetitive Behavior Scale, Intelligence Scales, Language Environment Analysis, Preschool Age Psychiatric Assessment, Aberrant Behavior Checklist, ATN GI Symptoms Inventory, Parenting Stress Index and also the amount of changes in brain activity was investigated using EGT, EEG, and brain MRI.In the results of all the reviewed articles, two points had been repeated, firstly, the treatment with the help of stem cells did not have any significant side effects, and the complications related to the immune system and the presence of infection were not observed and secondly, the results of cognitive tests in the areas of speech, social behaviors and repetitive behaviors had shown a significant improvement in the treated children.

Conclusion : In conclusion autism treatment with the help of stem cells can be considered a promising solution, with few side effects and safe in the treatment of autism spectrum disorder, although more studies are still needed in the field of cell therapy for autism patients.

Keywords : Mesenchymal stem cell, Autism, Stem cell

Count: 410
Abstract ID: 262
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Neuron cell sheet engineering

Submission Author: Saeedeh Zare

Saeedeh Zare[1], Saeedeh Zare jalise[2], sina habibi[3]

1. -
2. Department of Tissue Engineering & Regenerative Medicine, Faculty of Medical Sciences, Qom University of Medical Sciences, Qom, Iran
3. Department of Medical Laboratory Sciences, Faculty of Allied Medicine, Iran University of Medical Sciences (IUMS), Tehran, Iran.

Background and Aim : Injury to peripheral nerves can cause impairment and is still difficult to treat in a therapeutic environment. Disconnection of the distal and proximal stumps, macrophage/monocyte infiltration to clear myelin and axon debris, and eventual neuronal degeneration are all symptoms of trauma to peripheral nerves. A class of proteins known as neurotrophic factors controls the development, maintenance, and differentiation of neurons. Instead, because it is primarily supported by the development of cell-to-cell junctions and the release of ECM proteins, cell sheet technology is unrestricted by scaffolds. It overcomes the restrictions brought on by scaffold deterioration since its composition is like that of real tissues. Cell interactions and the sheet structure are well preserved due to the lack of proteolytic enzyme treatment during cell sheet harvesting. Cell sheets also have higher cell concentrations and more uniform cell distribution without being immunologically hampered by scaffold materials, which enhances regenerative capacity. To aid in the healing of peripheral nerves, adipose-derived stem cells (ASC) can create cell sheets made up of cells, cell-to-cell connections, and extracellular matrix. Cells adhere and grow properly at a lower critical solution temperature when using cell sheet engineering because variations in temperature cause oscillation between hydrophilic and hydrophobic states. Cell monolayers also separate on their own when the incubation temperature is decreased.

Methods : Two databases, PubMed and Embase, were searched for original papers pertaining to the brain cell sheet engineering. The search approach has two parts: cell sheet engineering and neuron regeneration. For additional independent review, full texts of articles that were deemed appropriate for inclusion were requested.

Results : Assembling three-dimensional (3-D) multilayered creations using this method has been adapted to replicate the intricate architecture of genuine tissues. For example, human aorta

endothelial cells, cardiomyocytes, and induced pluripotent stem cells have been used to create multilayered vascularized connective and myocardial tissues (iPSCs). Most multilayered cell sheets have been built by layering individual cell sheets together with forceps or a gelatin gel plunger. Cell sheet technology is a cutting-edge approach to cell treatments that is frequently employed in regenerative medicine.

Conclusion : It is widely known that the whole cell sheet technology process is essential for cell selection, cell preparation, cell harvesting, cell sheet type selection, and cell sheet applications. The primary objectives of cell sheet preparation are to increase cell sheet homogeneity and to encourage the establishment of the micro vessel network and ECM.

Keywords : neuron regeneration- cell sheet engineering-three-dimensional cell culture

Count: 411
Abstract ID: 272
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

The Effect of Epigallocatechin Gallate-Enriched Green Tea in Patients with Multiple Sclerosis: a randomized placebo-controlled trial

Submission Author: Mahdieh Azin

Mahdieh Azin[1], Zahra Nouri Vermal [2], Zahra Asadollahi [3], Fatemeh Ayoobi [4], Mohammad Reza Rahmani [5]

1. Physiology-Pharmacology Research Center, Research Institute on Basic Sciences, Department of Physiology and Pharmacology, School of Medicine, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
2. Student Resarch Committee, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
3. Department of Epidemiology and Biostatistics, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
4. Non-Communicable Diseases Research Center, Rafsanjan University of Medical Sciences
5. Physiology-Pharmacology Research Center, Research Institute on Basic Sciences, Department of Physiology and Pharmacology, School of Medicine, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

Background and Aim : Herbal compounds can be used as complementary therapies to improve multiple sclerosis (MS) symptoms. MS is an autoimmune and neurodegenerative disease of the central nervous system. The current study aimed to evaluate the effect of green tea (Camellia sineisis L) enriched with Epigallocatechin Gallate (EGCG) on MS patients.

Methods : Forty-eight patients were randomly divided into intervention (green tea) and control (placebo) groups in a three-blind randomized clinical trial. Eight patients were excluded from the study for personal reasons; thus, 20 participants remained in each group. Subjects received EGCG-enriched green tea powder or placebos in dose of 500 mg twice/day for three months. The intervention group was asked to maintain a normal diet for three months and take EGCG-enriched green tea powder (Camellia sineisis L specimen no.350) daily after a morning and night meal (one capsule every 12 hours). On the other hand, the control group was given a placebo. EGCG-enriched green tea powder and cellulose powder as placebo were prepared in 500 mg capsules by Giah Essence Phytopharm Co. Analysis of the capsules showed that the green tea capsule contains about 88 mg/capsule of polyphenol, 11.2 mg/capsule of EGCG and 12.4 mg/capsule of caffeine, and the placebo capsules contain 0.63 mg/capsule of polyphenol and EGCG and caffeine were not detected in it. Interleukin 10 (IL-10), serum levels of total antioxidant (TAC), upper and lower limbs function, cognitive function, mental status, fatigue, depression, and anxiety were measured at the beginning and at the end of the intervention.

Results : MS patients in both groups showed a reduction in their walking time and depression score after three months. Right-hand function and left-hand function were improved in the intervention group and control group, respectively. Serum IL-10 levels also declined in the intervention group. The other variables did not change significantly in the two groups.

Conclusion : The present study showed that interleukin 10 was reduced in green tea groups. Also, depression declined in both groups, and upper and lower limb functions improved in both groups. The depression reduction can be attributed to the friendly interactions in therapeutic groups, and the improvement in motor symptoms might be because of learning. A decrease in interleukin 10 can be a sign of disease stability. Future studies should be conducted to determine the optimal dose and appropriate duration of drug use. Furthermore, more sophisticated clinical trials should be conducted to demonstrate clinical differences better.

Keywords : Green Tea; Epigallocatechin Gallate; Multiple Sclerosis; TAC; IL-10; Cognitive Function

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Evaluation of Theory of Mind in Adolescents Born Through In Vitro Fertilization by Using Neuropsychological, Molecular Genetics techniques and Predicting the Occurrence of ASD by Using Machine Learni

Submission Author: Fazlollah Shahraki

Fazlollah Shahraki[1]

1. 1.Genetics of Non-Communicable Disease Research Center, Zahedan University of Medical Sciences, Zahedan, Iran 2. Institute for Cognitive Science Studies (IRICSS), Department of Cognitive Rehabilitation, Tehran, Iran

Background and Aim : Recent research findings show that autism is not a separate disorder, but rather It is located on a continuum. The peak of this disorder appears in sick patients, so it is important The necessity of this study is that, on the one hand, so far there is no study to investigate the relationship between tests Theory of mind has not been done with common gene expression changes between autism and IVF, so the changes The level of molecular markers related to social cognition skills using tools A laboratory such as evaluating gene expression can be performed.

Methods : The target population of this study was Iranian teenagers, 02 of whom were born through conception Laboratory (02), IVF of an autistic person with high performance and 02 people born from natural conception and Healthy within the age range of 20-21 years, after signing the consent form and performing the ADI-R tests. and carried out SRS, CARS, Ishiha and Rayon, and after it was determined that the person was a problem It doesn't have color recognition, Happe Strange Stories, Hide and Seek and tests They performed Moving Shapes Paradigm.

Results : GIGYF2 expression increased in 75% of IVF samples compared to the control sample and decreased in 0%. Also, its expression was unchanged in 25% of IVF samples. EIF4E2 expression was increased in 100% of IVF samples compared to control. The expression of EIF4G1 increased in 2% of IVF samples compared to the control and

Conclusion : Therefore, these genes can be used as markers for better diagnosis of autism samples with further investigations and can also be used as biomarkers for the evaluation of autism. These cases show that the IVF group with higher expression of these genes is more prone to autism

Keywords : IVF, Autism, Gene Expression, Theory of Mind

Count: 413
Abstract ID: 87
subject: Neurorehabilitation and Regeneration: Cognitive Rehabilitation
Presentation Type: Poster

The Comparison of conventional TDCS with new bioelectrical brain stimulation in acute social stress by examining hormonal and linear and non-linear indicators of heart rate variation changes.

Submission Author: Marzieh Barzegar

Marzieh Barzegar[1], Boshra Hatef[2], Gila Pirzad Jahromi[3], Habib Valipour[4]

1. neuroscience research center, Baqiyatallah university of medical sciences, Tehran, Iran
2. neuroscience research center, Baqiyatallah university of medical sciences, Tehran, Iran
3. neuroscience research center, Baqiyatallah university of medical sciences, Tehran, Iran
4. neuroscience research center, Baqiyatallah university of medical sciences, Tehran, Iran

Background and Aim : TDCS is a non-invasive method effective on the brain. However, matters such as the persistence of intervention and the mode of current (in terms of frequency, intensity, and duration) are still discussed in the management of acute stress. This study aims to present a new method of brain stimulation derived from Brain waves named BBI are compared to the typical current of brain stimulation (TDCS) in acute social stress.

Methods : Methods: In this study, 44 healthy young men were randomly assigned to three groups. Subjects were exposed to acute social stress with the triat social stress test protocol. After that, a stimulation current with an intensity of one milliampere for ten minutes was applied to the right side of the medial frontal cortex(between FPZ-F2)(anode electrode). The center of the head (between O2-P4) (Electrode Cathode) was applied according to all groups. Then the people entered the recovery phase for twenty minutes. Before, while, and after stress, after stimulation, and after recovery, ECG signal and saliva samples were taken. It is nothing that the stimulation current in the BBI group was the stored brain waves of people while watching a stand-up comedy video.

Results : The salivary cortisol level increased after stress in all three groups but did not reach a significant level in the sham group. After stimulation, there was no significant difference in the level of salivary cortisol between the groups. In the linear and non-linear indices of heart rate variation (HRV) although, during stress, a significant increase in heart rate, sympathetic tone, and HRV signal complexity in three groups were seen. However, there was no significant difference between the groups before stress after stimulation.

Conclusion : This study showed that electrical stimulation of the brain, whether in the form of TDCS or BBI current, did not change the level of salivary cortisol and HRV indices as indicators of the stress system, and no clear difference was seen between the types of currents. It is suggested that in creating the type of current BBI, other interventions could be better.

Keywords : stress, brain stimulation, cortisol, Heart rate

Count: 414
Abstract ID: 246
subject: Social Neuroscience: Self perception and regulation
Presentation Type: Poster

The effect of swallowing disorder on quality of life in patients with multiple sclerosis

Submission Author: Adeleh Rahimpour moradi

Adeleh Rahimpour moradi[1]

1. Iran University of medical science

Background and Aim : Multiple sclerosis is a progressive neurological disease in which one of the most important symptoms is dysphagia, which affects at least one-third of these patients. According to studies, dysphagia affects the mental, social, and physical function of the patient, and The side effects can be it can significantly affect the quality of life of these patients.

Methods : In this review, we did a general search in google scholar, Science Direct, and Scopus databases from 2015 to 2022 with keywords of Multiple sclerosis, quality of life, and dysphagia. 12 articles were selected according to inclusion criteria, and 7 of them were deleted by exclusion criteria.

Results : based on the patient's age and severity of the disease, Dysphagia can cause fatigue, sleep problems, increased eating duration, malnutrition, dehydration, inability to perform daily activities, reduced leisure time, dependence on others, decreased independence, increased anxiety, decreased self-confidence, decreased attendance at social events, depression, and decreased motivation in life.

Conclusion : Dysphagia caused by multiple sclerosis reduces social participation and independence in life by creating multiple complications in various individual and social dimensions and aspects, resulting in a decrease in the quality of life of these patients.

Keywords : swallowing disorder; quality of life; multiple sclerosis

From structure to behavior: An investigation in the prefrontal cortex, hippocampus, and basolateral amygdala in relation to social ranks.

Submission Author: Zeinab Parvin

Zeinab Parvin[1], Gila Behzadi[2]

1. Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Living in a social hierarchy can remarkably influence behavior and brain function. Based on the instinct behavior of animals, the dominant status is defined as the winner and the subordinate as a looser position. Upon previous studies, the social hierarchy could induce structural changes in the prefrontal cortex (PFC), the hippocampus, and the basolateral nucleus of the amygdala (BLA) that are involved in the regulation of emotional processing in social hierarchy-related behaviors. To define the neuro-biological alteration, dendritic spines density has been quantified in the two different social ranks. Since social status has an impact on anxiety and stress-like behaviors, we also evaluate anxiety-like behaviors in relation to social ranks.

Methods : Home-caged sibling Wistar rats (three rats/cage) were used in the present study. After the assumed time of hierarchy formation (weeks 9-10), a social confrontation tube test was done to determine social ranks. Then, we examined locomotor activity and anxiety-like behaviors using an open-field test (OFT) and elevated plus-maze (EPM) at weeks 12-13. Following behavioral tests, the rapid Golgi impregnation method was conducted to quantify the spine density of the first secondary branch of the primary dendrite (20 μm length).

Results : The results indicate that subordinate rats had significantly higher anxiety-like behaviors in the EPM compared to dominant rats, as observed in a lower percentage of open arm entries ($P<0.05$) and a higher percentage of close arm time ($P<0.05$). In the OF, no difference in locomotor activity and anxiety-like behaviors were seen. The spine density analysis revealed a significantly higher number of spines in subordinate rats, in comparison to dominant rats in PFC pyramidal neurons (21.5%, $P<0.05$), the apical and basal dendrite of hippocampal CA1 pyramidal neurons (23.6%, $P<0.05$, 22.6%, $P<0.05$ respectively), the granule cells of the dentate gyrus (11.7%, $P<0.05$). However, the spine density of pyramidal-like neurons in the BLA was higher in dominant rats than in subordinate rats (23.6%, $P<0.05$).

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Conclusion : Our findings revealed that the anxiety-like behaviors are associated with increased dendritic spines in the pyramidal neurons of PFC, CA1 area, and also granular neurons of the dentate gyrus in the hippocampus of subordinate rats. Contrary to that, the dominant/winner rats with repeated victory action, showed increased spine density on their secondary dendrite branches.

Keywords : Social hierarchy, Spine density, Anxiety, Social status

The effect of gender on the neurotrophic factors (IGF-1 and BDNF) in the rats hippocampus with PTSD under the influence of moderate treadmill exercise

Submission Author: Sakineh Shafia

Sakineh Shafia[1], Kobra Akhoundzadeh[2], Pardis Seyedpour[3]

1. Department of Physiology, Immunogenetics Research Center, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. PhD of physiology, Faculty of Nursing and Midwifery, Qom University of Medical Sciences, Qom, Iran
3. MSc Student in psychology, Rahian Novin Danesh Higher Education Institute, Sari, Iran

Background and Aim : Post-traumatic stress disorder (PTSD) is a psychiatric disease that occurs after war, accidents and natural disasters such as earthquakes, childhood abuse, rape and other events. But a small group of people will suffer from post-traumatic stress disorder in dealing with these incidents. The positive effects of exercise are not limited to physical issues, it also plays a significant role in improving mental health. Exercise has beneficial effects on the function and plasticity of the nervous system, prevents the damage of neurons caused by various diseases such as Parkinson's and Alzheimer and at the same time increases the production of new neurons. The effect of exercise in the treatment of many neurodegenerative diseases such as Parkinson, Alzheimer and schizophrenia has been proven. A series of human and animal studies have shown that exercise increases learning and memory, And possibly reduces the risk of neurodegenerative diseases. The positive effects of exercise on cognitive activities are applied through increasing neurogenesis in the hippocampus, increasing the plasticity of synapses, and increasing the release of growth factors. Two growth factors that play an important role in mediating the effect of exercise on the brain are BDNF and IGF-1. Various studies show that the amount of these two growth factors increases both in the serum and in the brain during exercise. Women are more likely to suffer from mental disorders related to anxiety and stress than men. Women are not only twice as likely to develop PTSD after a traumatic accident than men, but the severity and duration of its symptoms are also greater in women. But there is still no accurate information about how both sexes respond to treatment.

Methods : Male and Female rats were exposed to SPS (restraint for 2 h, forced swimming for 20 min and ether anaesthesia) and then, were kept undisturbed for 14 days. Afterwards, they underwent a treadmill exercise regimen (4 weeks, 5 days per week), followed by hippocampal BDNF and IGF-1 assessment by ELISA kit. The sexual cycle of the females in each group was synchronized

Results : SPS male and female rats exhibited decreased hippocampal BDNF and IGF-1. Moderate treadmill exercise increased these factors. But we did not see any difference in the response of both sexes to the effect of exercise on the production of nerve growth factors

Conclusion : Our findings strongly support that exercise training can prevent the harmful effects of traumatic events on neurotrophic factors.

Keywords : Post-traumatic stress disorder, Single prolonged stress, Moderate exercise, BDNF , IGF-1

Count: 417
Abstract ID: 293
subject: Special topics: Neuro-aesthetics, Art and Creativity
Presentation Type: Poster

The Continuum of Novelty-Surprise: Theoretical development of discussion for neurological research

Submission Author: Gooya Bozorgi

Gooya Bozorgi[1]

1. Lecturer in IT and computer graphic design, Iran Technical & Vocational Training Organization

Background and Aim : Novelty, unexpectedness and surprise are intimately connected to, attention, motivation, learning and exploratory behavior. Despite this, the theoretical foundations of these conceptions are debatable. The purpose of this article is the Theoretical development of this topic in Cognitive Sciences and neurological research. Although novelty and surprise seem to be two separate notions, this is controversial. As we show novelty is a continuum by itself that changes from "interestingness" to "amazing" and the surprise is a transition point on it. Moreover, the continuum of novelty-surprise (in short " the novelty continuum") would generally play an important part in aesthetic experience.

Methods : Considering that conceptual art makes good use of the elements of novelty and surprise in the work, it is a suitable field for examining the novelty continuum. This paper has reviewed several case studies in contemporary conceptual art (especially Kader Attia's works). For this purpose, theoretical components, including "singularity" and "expectation", have been examined in connection with the levels of surprise.

Results : The findings of this article support the theory of the novelty continuum. Therefore, attention, motivation, learning, and exploratory behavior have a close relationship with levels of novelty and surprise. The function of elements of the novelty continuum is vital in artwork, especially conceptual art, and in addition, it has an organic connection with the aesthetic levels of the work.

Conclusion : Based on the model of the novelty continuum, the levels of novelty including "being novel", unexpectedness and surprise can be distinguishable. These levels In addition to the cognitive function, it is also effective in the aesthetic function of the works.

Keywords : Novelty; surprise; the novelty continuum; attention; aesthetic experience; cognitive function.

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Count: 418
Abstract ID: 120
subject: Special topics: Neuro-aesthetics, Art and Creativity
Presentation Type: Poster

Analyzing the Impact of Injectable Date (Phoenix Dactylifera) Hydroalcoholic Extract on Pentylene Tetrazole Induced Seizures in White Mice

Submission Author: Hooman Esfahani

Hooman Esfahani[1], Nahid Jivad[2], Zahra Forouzandeh Shahraki[3]

1. Clinical Research Development Unit, Ayatollah Kashani Hospital, Shahrekord University of Medical Sciences, Shahrekord, Iran
2. Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran
3. Deputy of Research and technology, Shahrekord University of Medical Sciences, Shahrekord, Iran

Background and Aim : Dates are well known for their antioxidant and neurological effects in traditional medicine.This assertion has frequently lacked a scientific foundation. The goal of this study was to find out if the hydroalcoholic extract of dates could help stop the seizures that pentylene tetrazole causes in Balb/c mice

Methods : Pentylene tetrazole (90 mg/kg) was employed in this experiment to cause seizures. Mice were divided into eight groups. The control groups were split into PTZ, PTZ and distilled water, PTZ and phenobarbital, and non-intervention groups. The case groups were given the extract at concentrations of 30, 100, and 300 mg / kg 45 minutes prior to injection. Following PTZ injection, the observer noted and compared the beginning, end, and severity of seizures as well as the mortality of mice in various groups. Blood sugar, salt, potassium, calcium, and phosphorus levels in various groups were also measured.

Results : At the conclusion of the trial, there was a significant difference in seizure onset between the groups 1 and 3 (p 0.001), 3 and 4 (p 0.01), and 3 and 6 (p 0.05). It was also noted that there was a significant difference in seizure length between groups 3 and 4 and groups 3 and 5, respectively (p 0.05) and (p 0.001). In serum factors, there was also a significant difference in the potassium and sodium levels between groups 3 and 5 and 5 and 6, as well as between groups 5 and 6. Other groups didn't show any observable differences

Conclusion : The results of this study showed that the hydroalcoholic extract of dates reduced the severity and duration of seizures in the study groups.

Keywords : seizures, dates, and pentylene tetrazole.

Count: 419
Abstract ID: 166
subject: Special topics: Neurolaw
Presentation Type: Poster

Medico-Legal issues and neurorights in neuroscience

Submission Author: Seyed Mohammad Bahreini

Seyed Mohammad Bahreini[1], Auob Rustamzadeh[2]

1. Legal Department of Research Institute of Archeology and Cultural Heritage, Tehran, Iran
2. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Neurorights has opened new horizons in the field of human rights, which is inevitable to accept due to the recent and upcoming developments in neuroscience. Consciousness and cognition, especially in the mind domain, are the last achievement of brain evolution, the degree of personal freedom and free will, which is considered as a safe haven for maintaining thoughts, opinions and beliefs. Although in the past it was thought that the mind was inaccessible compare to the body due to its intangible nature, this is possible with current emerging as well as their increasing development neurotechnologies including neural network, brain-machine interface and neuroinformatics.

Methods : We considered the PRISMA guideline to perform a systematic review, in which high-impact articles, peer review journals, and relevant subjects in regard to our work were selected from Pubmed, Elsevier, and Web of Science with the search query of ((Neuroscience AND Law), (Medico-Legal OR Neurotechnology), AND (Neurorights OR Mind)) in the title and abstract of the research and review articles.

Results : While advance neurotechnologies can be greatly effective in promoting new preventive, diagnostic and therapeutic strategies in neurological diseases, they can also be misused and create serious threats to the free will, the mind and to the individuals' capacity to control their behavior. In this regard, modalities of neuroscience research such as Electrocorticography, Microelectrode Arrays, Quantitative electroencephalogram (QEEG), virtual reality (VR), Functional near-infrared spectroscopy (fNIRS), and functional magnetic resonance imaging (fMRI) have the potential visualize parts of mental information. These technologies have the ability to understand the functioning of the human brain and to detect the mental states and behavior prior to any observable and practical act. Nevertheless, legally, the steps to create legal responsibility for a person depend on practical action after the decision-making process, and the steps before that, such as intention, purpose, motivation, and inner will, are not included. Obviously, according to certain legal rules, no person can be prosecuted or punished for having a criminal motive. Therefore, the scientific

and therapeutic community of neurosciences needs precise national and international laws to protect the four neurorights principles including 1)the right to cognitive liberty, 2) the right to mental privacy, 3)the right to psychological continuity, and 4) the right to free will.

Conclusion : There is concern about advances in neuroscience technologies associated with inflation and devaluation of rights. Instructions of neurorights should be reflected a fundamentally important value, be consistent with, the existing body of human rights law, and be capable of achieving a very high degree of international consensus. It seems that in the not too distant future, neurotechnology methods in the legal field, especially tort law, criminal law and law enforcement, will be increasingly considered, therefore it is important to prevent the creation of mental and psychological injuries and Also, to prevent pre-judgments, legal guidelines should be developed with the help of neuroscientists, judges, lawyers and psychiatrists with the help of local and international political organizations.

Keywords : Neurorights; mind; law; neurotechnology; legal issues

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What does the brain tell us about crime?

Submission Author: Parya Abravani

Parya Abravani[1]

1. PhD Candidate in Cognitive Psychology, Institute for Brain and Cognitive Science, Shahid Beheshti University, Tehran, Iran, 0000-0003-3860-7521

Background and Aim : Criminology is an interdisciplinary science within the behavioral sciences and is particularly informed by studies in sociology (especially the sociology of deviance), social anthropology, and psychology, as well as writings in law. Neuro-criminology is part of a research program called "Biosocial Criminology" that examines "biological correlates of antisocial behavior" and "heritable propensity for criminal behavior". Significantly, research in neuroscience has identified brain features (both structural and functional) that appear to be consistently associated with antisocial personality traits found in certain groups of criminals, such as murderers and child abusers. There is evidence to show that certain neurobiological characteristics (along with environmental factors) may predispose a person to antisocial and violent behavior. Neuro-criminology applies neuroscience methods, particularly fMRI, to make claims about crime, deviance, and maladjustment. It is an interdisciplinary scientific field composed of researchers from various disciplines who "use neuroscience techniques and principles to improve our understanding of crime."

Methods : One of the methods of investigating the performance of criminals is the use of resting-state functional connectivity, which is obtained by fMRI images. This study reviewed the literature in this field. Articles from 2010 to 2021 were reviewed in Google Scholar, PubMed, and PsycINFO platforms with keywords, RSFC, fMRI, violence, aggression, crime, and criminals.

Results : The results indicate that the functional connectivity in the resting state in people with aggressive behavior and criminals is a suitable marker for aggressive behavior. The results show that the functional connections between the prefrontal and amygdala are disturbed and this disturbance is in the form of a decrease in connectivity.

Conclusion : The results provide directions for future research and for creating a more accurate model of propensity for violence, in order to create effective treatment and prevention programs.

Keywords : Neuro-criminology; RSFC; fMRI; violence

Count: 421
Abstract ID: 50
subject: Special topics: Public Awareness
Presentation Type: Poster

The Role of AMPK-Dependent Pathways in Cellular and Molecular Mechanisms of Metformin: A New Perspective for Treatment and Prevention of Diseases

Submission Author: Amin Hasanvand

Amin Hasanvand[1]

1. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran.

Background and Aim : Metformin can suppress gluconeogenesis and reduce blood sugar by activating adenosine monophosphate-activated protein kinase (AMPK) and inducing small heterodimer partner (SHP) expression in the liver cells.

Methods : In the present review study, 148 articles from electronic databases or search engines such as PUBMED, GOOGLE SCHOLAR, SID have been reviewed.

Results : Several studies have indicated that apart from its significant role in the reduction of blood glucose level, metformin activates the AMPK enzyme that in turn has various efficient impacts on the regulation of various processes, including controlling inflammatory conditions, altering the differentiation pathway of immune and non-immune cell pathways, and the amelioration of various cancers, liver diseases, inflammatory bowel disease (IBD), kidney diseases, neurological disorders, etc.

Conclusion : Metformin's activation of AMPK enables it to control inflammatory conditions, improve oxidative status, regulate the differentiation pathways of various cells, change the pathological process in various diseases, and finally have positive therapeutic effects on them. Due to the activation of AMPK and its role in regulating several subcellular signalling pathways, metformin can be effective in altering the cells' proliferation and differentiation pathways and eventually in the prevention and treatment of certain diseases.

Keywords : AMPK, Metformin, Diseases

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Count: 422
Abstract ID: 198
subject: Special topics: Public Awareness
Presentation Type: Poster

The Impact of Sex Differences in the Alzheimer's Disease and Cognitive Impairments: A Systematic Review and Meta-analysis

Submission Author: Kimia Vakili

Kimia Vakili [1], Mobina Fathi[2], Shirin Yaghoobpoor[3]

1. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Student Research Committee, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : It has been shown that Alzheimer's disease (AD) affects women more than men. This study has been designed to evaluate the contribution of probable risk factors which may affect this unequal prevalence.

Methods : Databases searched included PubMed, Scopus, Embase, Cochrane and Web of Science databases. A random or fixed-effects models was used for each estimation. I2 index was used to assess the heterogeneity of the studies. Egger and Beg tests were used to assess publication bias. Analysis was done using Stata version 14.2.

Results : Extracted data covered 4,459 patients (2,244 males and 2,215 females) with a history of cognitive decline from 22 studies . Based on the severity of cognitive decline, participants were classified into three groups: Alzheimer Disease (AD), Mild Cognitive Impairment (MCI), and subjective cognitive decline (SCD). The overall mean age was 73.65 (95% CI: 72.07-75.24; I2 = 98.4%) for men and for women was 72.40 (95% CI: 70, 20 -74.60; I2 = 99.3%). The findings indicate that the mean MMSE score did not differ between men (27.16; (95% CI: 26.66-27.65; I2 = 97.7%) and women (26.86; 95% CI: 26.31-27.41; I2 = 98.8%). Mean years of education were reportedly higher in men (15.04 years; 95% CI: 14.39 -15.69; I2 = 96.9%) than in women (14.01 years; 95% CI: 13, 39-14.64; I2 = 96.7%). APOE-ε4 allele frequency did not differ between sexes, at 46% (95% CI: 40-53; I2 = 100.0%) in men and 46% (95% CI: 31-55; I2 = 98.1%) in women.

Conclusion : According to this study, a higher prevalence of cognitive impairment among women may be partially justified by higher median age and lower education levels. Contribution from other unmeasured factors remains to be understood as studies continue to examine sex differences in AD.

Keywords : Alzheimer's disease, Gender, MCI, APOE-ε4, MMSE, Educational Status

Count: 423
Abstract ID: 136
subject: Special topics: Public Awareness
Presentation Type: Poster

Distinct signatures on D-galactose-induced aging and preventive/protective potency of two low-dose Vitamin D supplementation regimens on working memory, muscular damage, cardiac and cerebral oxidative

Submission Author: Mohammad Zamanian

Mohammad Zamanian[1], Mohammad Yasin Zamanian[2]

1. -
2. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran.

Background and Aim : Chronic administration of D-galactose in rodents reproduces over-production of reactive oxygen species of physiological aging. The present research shows for the first time distinct signatures on D-galactose-induced aging (500 mg/kg, 6 weeks) and the preventive and protective potential of two Vitamin D (50 IU) supplementation regimens (pre-induction and simultaneous, respectively) in two vital organs (heart and brain). D-galactose induced notorious alterations in working memory, strong increase of brain malondialdehyde (MDA) oxidative levels, strong downregulation of sirtuin 1 (SIRT1) in the heart and hippocampus, and of calstabin2 in the heart. Cardiac and brain superoxide dismutase (SOD) and glutathione peroxidase (GPx) enzymatic antioxidant capacities were damaged, brain calstabin2 was downregulated, and neuropathology was observed.

Methods : In the current study, the compared the preventive and therapeutic effects of Vitamin D (1 µg/kg/day p.o.) in the heart and brain of male mice treated with D-gal (500 mg/kg/day p.o.) for six weeks.

Results : Working memory deficits of D-gal-treated animals were restored by VitD administration as measured in the Y-maze. Preventive treatment with Vit D was more effective than concomitant to increase superoxide dismutase (SOD), glutathione peroxidase (GPx) activities, and decrease malondialdehyde (MDA) levels in aging mice brains and hearts. Histopathological H&E staining LDH and CK levels and SIRT1 and Calstabin2 down-regulation was restored. In conclusion, preventive schedule was more effective in oxidative stress, gene regulation, but equipotent to therapeutic actions

Conclusion : the present results on the preventive and protective effects of VitD on brain oxidative stress and reversal of cognitive in the D-gal-induced aging mouse model identify potential new pharma-cological/therapeutic use of Vit D, providing new evidence for its drug repurposing.

Keywords : Aging; Antioxidant activity; Cognition; Vitamin D; SIRT1; Calstabin2; D-galactose; Mice; Oxidative stress

Cross-modal perception and decision making

Submission Author: Hesamodin Oloumi Dodaran

Hesamodin Oloumi Dodaran[1], Parya Abravani[2]

1. Master of clinical psychology, Islamic Azad University Science and Research branch, Tehran, Iran
2. PhD Candidate in Cognitive Psychology, Institute for Brain and Cognitive Science, Shahid Beheshti University, Tehran, Iran

Background and Aim : The first feature in the products that catches our eyes when entering a store is the packaging of the products in that store. Today, packaging is not only used to protect the product but also as a tool to increase sales as well as create brand equity. Packaging is one of the most attractive branches of neuromarketing. Neuromarketing is a science that uses neuroscientific tools such as EEG, fMRI, MEG and Eye tracking to investigate people's decision-making. One of the sales challenges is the impact of various factors in buying a product. One of the environmental factors that influence people's purchasing decisions is the smell emitted in the environment. Due to the fact that in scientific articles, the olfactory modality has been worked less than other modalities, the present study examines the decision-making process in both behavioral and electroencephalographic aspects of tea packaging

Methods : Twenty (10 female and 10 male) students of Shahid Beheshti University between ages 18 to 35 participated in the study

Results : . The results obtained from behavioral data and brain frequencies show that odor has no effect on the reaction time and the choice of the popularity of tea packaging, and naturally there was no change in brain frequencies. The findings show that when people see odors as words in a questionnaire, they associate them with a particular shape and color, but they do not do an excellent job of identifying odors when they are spread in the environment

Conclusion : However, in the present study, there were significant changes in the smell of cinnamon and mint in one of the expected shapes and colors. Although there were changes in behavioral data, these changes did not occur at the brain frequency level. More complex and precise stimuli may be needed to make changes at the electrophysiological level

Keywords : odor, packaging, EEG, cross-modal, visual perception, decision making

Count: 425
Abstract ID: 122
subject: Special topics: Neuro-Marketing, Neuro-economics
Presentation Type: Poster

What you smell can affect what you choose

Submission Author: Hesamodin Oloumi Dodaran

Hesamodin Oloumi Dodaran[1], Parya Abravani[2]

1. Master of clinical psychology, Islamic Azad University Science and Research branch, Tehran, Iran
2. PhD Candidate in Cognitive Psychology, Institute for Brain and Cognitive Science, Shahid Beheshti University, Tehran, Iran

Background and Aim : Our decisions are influenced by many factors, and one of these factors is our senses. Our senses integrate with each other and create a complete understanding of our surroundings, which is called cross-modal. Due to the fact that in scientific articles the olfactory modality has been worked less than other modalities and the decision-making process has behavioral and electrophysiological aspects the present study examines both of them. The aim of this study was to investigate the brain frequencies when inhaling odors in the environment and their effects on product packaging decisions

Methods : Twenty (10 female and 10 male) students of Shahid Beheshti University between the ages of 18 to 35 participated in the study

Results : Results show a shorter reaction time, in odor conditions, compared with the odorless conditions. The EEG results show significant differences in 1-4 Hz (delta band) in channels FC5 and P4; in 4-8 Hz (theta band) in FC5, F4, and P4 channels; in 8-13 Hz (alpha band) in F3, FZ, F4, FC5, FC2, FC6, C3, CZ, C4, T7, T8, CP5, CP1, CP2, CP6, P3, PZ, P4, PO4, and P8 channels and also in 13-30 Hz (beta band) in channel P4

Conclusion : These results show that a visual and olfactory cross-medal is formed in individuals, which simultaneously reduces the reaction time of individuals, and given that if we consider that there are two decision systems 1 and 2, it strengthens system 1 and will probably increase the purchase in proportion to the visual shape and color

Keywords : odor, packaging, EEG, cross-modal, visual perception, decision making

Count: 426
Abstract ID: 64
subject: Special topics: Neuro-Marketing, Neuro-economics
Presentation Type: Poster

Odor and Decision making

Submission Author: Parya Abravani

Parya Abravani[1], Hesamodin Oloumi dodaran[2]

1. PhD student of Cognitive Psychology, Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Master of clinical psychology, Islamic Azad University Science and Research branch, Tehran, Iran

Background and Aim : Packaging is a crucial means to induce a consumer to try a product. Studies show that it has less than three seconds to grab the attention of the customer. We have an integrated understanding of our senses, which is exactly what is considered in sensory marketing. Sensory marketing is a set of marketing techniques that aim to use the senses to influence consumer behavior and the way they make purchasing decisions. The main goal of sensory marketing is to use the five senses to influence people's purchasing decisions. One of the most important senses studied in sensory marketing today is the sense of smell. Studies on sensory marketing and on odors show that the presence of odors influences people's decisions. In this study, in addition to studying the popular smells among Iranians for distribution in shops, the link between the sense of sight and smell and its effect on food packaging was specifically addressed. This research seeks to create an innovative link to sell products with respect to the cross-modal created between the sense of smell and sight in food packaging

Methods : In this research, biscuit, tea, and chocolate packaging are considered. In this way, according to the smells and colors in the shapes that they evoke, packages were designed for the product and were shown to participants in the form of a task. The research task was that separate blocks were considered for each product. Each block contains 48 trials which include 16 stimuli, each of which was repeated three times)3 green rectangles, 3 yellow rectangles, 3 brown rectangles, 3 red rectangles, 3 green triangles, 3 yellow triangles, 3 brown triangles, 3 red triangles, 3 green circles, 3 yellow circles, 3 brown circles, 3 red circles, 3 green ovals, 3 yellow ovals, 3 brown ovals, 3 red ovals (. The task diagram is given in figure1. In each trial, the instruction appears in 2s and then stimulus appears and the person announces the suitability of the package based on the Likert scale from 1 to 5 (one minimum and 5 maximum). There is no limit to response time. For all three products, we had 4 conditions that included three scents of lemon, mint, and cinnamon and an odorless condition.

Results : The results of our research show that changes in the reaction time of individuals in response to the type of packaging occur when the odor is released into the environment. In fact, there is no significant change in the popularity of packaging depending on the type of odor emitted in the environment. The results suggest that smelling an odor triggers identification attempts (automatically) and that odor source assumptions shape and color the characteristics of visual mappings.

Conclusion : Based on what has been achieved in previous studies and the present study, it is suggested that the use of sensory marketing and especially the use of cross-medals between smell and sense of sight will help companies to choose the right packaging. In addition, creating a pleasant smell in the environment is associated with the choice of product packaging and leads people to choose round packaging. It is also suggested that multisensory perception seems to reduce people's reaction time and make people choose faster, which seems to further strengthen sensory marketing.

Keywords : Neuromarketing, Sensory marketing, Food packaging

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Count: 427
Abstract ID: 128
subject: Special topics: Neuro-Marketing, Neuro-economics
Presentation Type: Poster

Emotion against Cognition: A review of factors affecting decision making in marketing with the help of data gathered by biometric tools

Submission Author: Najme Afee

Najme Afee[1]

1. MSc student in Cognitive Science, University of Tehran

Background and Aim : It is essential for marketers to know about the decision-making process of consumers, considering that the purpose of advertising is to influence customers' decisions. Previously, traditional methods such as surveys were used. The data obtained this way was not reliable because it did not take into account the hidden motivations or unconscious factors involved in people's decision making. As a result, a new field called "neuromarketing" emerged, in which the marketing perspective was combined with neuroscience, economics, and psychology and sought to investigate preferences, motivations, and expectations, and to understand the subconscious mind of consumers. Using biometric and brain imaging technologies such as EEG, eye tracking, and GSR, this field aims to identify factors affecting consumer behavior and predict their decision-making processes. Neuromarketing has brought powerful insights and techniques to consumer research with the logic that understanding how people's brains perceive, process, think and react makes marketing strategies more effective. In the present study, the effect of emotional components along with cognitive components on people's marketing decisions, which is taken from the results of working with biometric tools, is investigated.

Methods : In this review study, 14 journal articles from different scientific databases have been examined. These articles meet a number of criteria: their impact factor was higher than 1, they were all research articles and they were published in the last six years.

Results : Reviewing different studies shows that different factors affect people when they decide to buy something. For example, the colors used in advertisements have an effect on choosing a product or not. Based on these results obtained with the help of neuromarketing tools, we can understand that the direct recording of brain activity is a practical and useful way to measure people's reactions to the presented stimuli. The role of emotions in the decision-making process during purchase was determined in the same way. The use of neuroscience in marketing and applying new technologies such as EEG made the study of the effect of the emotional aspect of people in neuromarketing research more prominent. In general, neuromarketing is able to depict

the complexity of emotional experience using neurological and physiological data, separate from the cognitive process, and provide a reliable output.

Conclusion : The evaluation of marketing stimuli on the brain activities of consumers has led to the formation of new insights about their behavior towards advertisements and can be useful for brands and products in various aspects. However, issues such as high cost and limitations in the use of biometric tools may be an obstacle to the progress of neuromarketing research. In any case, given the marked complexity of the human brain, neuromarketing research is at the embryonic stage, considering the high desire of researchers to work in this field, we can imagine a bright future for it.

Keywords : Decision making, Emotion, Marketing, Neuromarketing, Biometrics

Count: 428
Abstract ID: 173
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Increased Suicide of Iranian Resident Physicians in the COVID-19Pandemic

Submission Author: Somayeh Nazari

Somayeh Nazari[1], Hamed Ghazvini[2], Seyedeh Masoumeh Seyedhosseini Tamijani [3], RahelehRafaiee[4]

1. Student Research Committee, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, IR Iran
2. ran University of Medical Sciences, Sari, IR Iran
3. Psychiatry and Behavioral Sciences Research Center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, IR Iran
4. * Corresponding author: Department of Neuroscience, School of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, IR Iran. Email:rachel.rafaie@yahoo.com

Background and Aim : The suicide rate among physicians has been reported to be higher than that among the public as a whole .Several factors, including the knowledge of the lethal doses of medications, increased access to potentially lethal medications, and untreated or inadequately treated mental illnesses (eg, depression and anxiety), increased the rates of suicide completion among physicians .This increased rate is often associated with long working hours, the high-stress culture of medicine, the relative neglect of self-care, and spending less time with family and friends . Medical students and physicians in residency programs appear to be at higher risk of burnout, depression, and substance abuse. A meta-analysis reported that there is an increase of 15.8% in depressive symptoms in the first year of residency. Over the course of training, 20.9 - 43.2% of residents showed depressive symptoms. Rotenstein et al. reported that the prevalence of suicidal ideation among medical students was 11.1%. Medical literature suggests that the enhanced rate of suicide during and after a stressful environment due to pandemics is not unusual. Jahan et al. reported about coronavirus disease 2019 (COVID-19)-related suicides among healthcare professionals the most common reason for which was infection with COVID-19, followed by a stressful and heavy workload, the fear of COVID-19 infection, anxiety related to the transmission of the virus and mortality of patients, and increased emotional stress . Although several publications anticipated having higher healthcare providers' suicidality due to the COVID-19 pandemic, there is no systematic information on residents' and physicians' suicides due to the current pandemic.

Methods : The present study was carried out in June 2021. This study reviewed Iranian news websites addressing the suicide of Iranian resident physicians observed through the use of the Google search engines by searching Persian equivalences of key terms (eg, suicide, physician, resident, and medical student). The results showed that Iranian news agencies reported that the number of suicides among physicians/residents was 15 from 2019 to June 2021.

Results : In numerous countries, suicide is a silent epidemic due to the culture of silence. Exposure to public suicide-related information could make others start thinking about self-harm, suicidal thoughts, and suicidal plans. On the other hand, suicide issues remain poorly understood in resident physicians, and their problems are mostly neglected. According to the report of the Iranian Students News Agency from Iran's Medical Organization spokesman, work pressure, particularly in the COVID-19 pandemic, and economic pressure are the problems faced by medical students and residents.

Conclusion : The reinforcement of protective factors for suicide, including access to health care, experience in conflict resolution, support of family and community, and religious beliefs, should be addressed. The mental health of residents and timely screening should be considered before they attempt suicide.

Keywords : Iran, Physicians, Suicide, COVID-19

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   **Tehran, Iran**

Count: 429
Abstract ID: 214
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Investigating the relationship between Covid-19 severity and demographic, temperament (Mizaj) and psychological variables: Results of population-based studies in Iran

Submission Author: Gila Pirzad jahromi

Gila Pirzad jahromi[1], Ahmad Afzali[2], Gholam Hossein Meftahi[3], Boshra Hatef[4]

1. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
2. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
3. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
4. Neuroscience Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

Background and Aim : The vital threats posed by the outbreak and rapid spread of coronavirus (Covid-19) to people around the world have led to serious mental health disorders. However, the individuals' reactions to the Covid-19 disease vary depending on the people's temperament, individual differences and personality traits. Therefore, the present study assessed the extent to which severity of Covid-19 disease are associated with some mental disorder incidence after recovery, temperament, demographic factors and individual differences.

Methods : An online survey was sent to COVID-19 patients to collect their demographic information, COVID-19 symptoms, and clinical data. The Depression, Anxiety and Stress Scale (DAAS-21) questionnaire, Beck Depression Inventory (BDI-II), Spiel Berger State-Trait Anxiety Inventory (STAI) , Pittsburgh Sleep Quality Inventory (PSQI), and Persian general and brain temperament Questionnaire were also completed by 258 participants (127 men and 131 women) 45 days after recovery from COVID-19. Non-parametric analysis was used for statistical analysis

Results : Results showed the significant relationship of demographic factors such as weight, age and gender with the severity of the COVID-19 ($P < 0.05$). Mean scores of brain temperament (warm/cold) in the severe group were significantly lower than the moderate and mild groups ($P < 0.05$). There was a significant increase in the dry/wet temperament of the brain in the severe and moderate groups compared to the mild group ($P < 0.05$). The results of DASS-21 showed a significantly higher anxiety in patients with severe COVID-19 compared with moderate and mild groups ($P < 0.05$). The severe group was found to be significantly different compared to moderate group in the results of BDI-II ($P < 0.05$). The result of STAI (state and trait) showed a significant difference between the severe group and the mild and moderate groups. The score of PSQI between the moderate and mild groups was significant ($P < 0.05$).

Conclusion : These results indicate the relationship between demographic factors such as weight, age and gender, brain temperament, as well as some psychological factors such as sleep quality and anxiety with the severity of the COVID-19 disease. The present findings also have practical implications in developing future plans to prevent severe disease and avoid wasting health resources.

Keywords : Covid-19, severity, Demographic information, Psychological factors, Temperament

Count: 430
Abstract ID: 312
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Schizophrenia and COVID-19: review on morbidity and mortality rate

Submission Author: Sepideh Ebrahimian vargahan

Sepideh Ebrahimian vargahan[1], Dr.Arshad hoseini[2], Maryam eini[3]

1. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Department of Medical Biotechnology, Faculty of Allied Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Schizophrenia is a psychotic disorder characterized by hallucinations, delusions, and disturbances in thought, perception, and behavior. Patients with schizophrenia are more likely to be in the hospital, experience disability, and have a poor quality of life. Schizophrenia may increase the risk of COVID-19 morbidity for individuals with the disease. In this study, we reviewed the association of schizophrenia patients suffering from significant COVID-19 with morbidity and mortality.

Methods : A comprehensive search of PubMed, Scopus and google was performed using specific keywords of COVID-19 and schizophrenia that was used in title or abstract.

Results : By reviewing different cohort study as well as systematic review and meta-analysis, it was cleared that individuals with schizophrenia were more than twice as likely to be hospitalized due to COVID-19 [OR 2.13, 95%CI 1.62–2.81, P < .0001] and more than 3 times more susceptible to COVID-19 mortality [OR 3.14, 95%CI 1.34–7.36. P < .0001] compared to those without schizophrenia. In addition, it was demonstrated that there were several risk factors which influenced the relationship between schizophrenia and mortality from Covid-19 including age (beta coefficient: -0.0334; 95% CI: -0.0519, - 0.0150; p =0.0004) and smoking (beta coefficient: 0.0269; 95% CI: 0.0082, 0.0456; p = 0.0048). The explanation that could be proposed for the findings would be that people with schizophrenia may be late in seeking treatment or people with schizophrenia may have susceptibility because of immune system dysregulation.

Conclusion : To sum up, patients with pre-existing schizophrenia have a higher risk of dying from Covid-19. Hence schizophrenia patients need special attention and should be prioritized for COVID vaccination.

Keywords : Schizophrenia; COVID-19; morbidity; mortality

Count: 431
Abstract ID: 311
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

A Review on the Neurological Manifestations of COVID-19 Infection: a Mechanistic View

Submission Author: Hamid Soltani Zangbar

Hamid Soltani Zangbar[1]

1. Department of Neuroscience and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Golgasht Street, Tabriz, East Azarbayjan, Iran

Background and Aim : There is increasing evidence of neurological manifestations and complications in patients with coronavirus disease 19 (COVID-19). More than one-quarter of patients with COVID-19 developed various neurological symptoms, ranging from headache and dizziness to more serious medical conditions, such as seizures and stroke.

Methods : All related articles from different databases such as science direct, google scholar, and PubMed were evaluated and and the most relevant articles were used.

Results : The recent investigations introduced hyposmia as a potential early criterion of infection with COVID-19. Despite the high mortality and morbidity rate of COVID-19, its exact mechanism of action and pathogenesis is not well characterized. The spike protein of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) could interact with angiotensin-converting enzyme 2 (ACE2) in the endothelial, neural, and glial cells. In the present study, we reviewed the most common neurological manifestations and complications that emerged after infection with the SARS-CoV-2 and discussed their possible relation to the expression and function of ACE2.

Conclusion : Comprehensive and detailed studies are required to uncover how this virus invades the neural system as well as other critical organs.

Keywords : COVID-19 . ACE2 . Vascular . Brain . Angiotensin . Cytokine

11th Basic and Clinical Neuroscience Congress 2022
February 13-14, 2023   Tehran, Iran

Count: 432
Abstract ID: 389
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Neurological Manifestations in COVID-19: first 100 patients summary from Karaj

Submission Author: Arsh Haj Mohamad Ebrahim Ketabforoush

Arsh Haj Mohamad Ebrahim Ketabforoush[1], Fereshteh Azedi[2], Mohammad Taghi Joghataei[3], Hadi Montazerlotfelahi[4]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
3. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran
4. Department of Pediatric Neurology, Imam Ali Hospital, Faculty of Medicine, Alborz University of medical sciences, Karaj, Iran

Background and Aim : The SARS-CoV-2 pandemic is the most challenging crisis in the current world. In addition severe pulmonary involvement, the virus also has numerous extrapulmonary involvements, and there are new signs and symptoms related to it every day. The present study aimed to inquire about the frequency of neurological manifestations and risk factors of COVID-19.

Methods : This was a retrospective study including first 100 patients with neurological manifestations who were admitted to the Alborz academic hospitals, and their infection with COVID-19 had been confirmed. The data included in the analysis were the patient's demographic information, comorbid conditions, neurological involvements, and laboratory results.

Results : The study included 100 patients with a mean age of 59 years. Neurological symptoms and signs were seen in 91% and 10% of the patients, respectively. The most frequently related neurological symptoms of COVID-19 were fatigue (49%), headache (47%), and dizziness (45%). Also, the most common neurological manifestation detected included gait disorders (6%), cerebellar dysfunction (4%), and cerebrovascular accidents (3%). It was demonstrated that positive troponin was the effective indicator of neurological signs (OR=21, P=0.01), followed by WBC?15000 (OR = 20.75, P=0.01) and history of respiratory disease (OR=7.42, P=0.007).

Conclusion : Neurological symptoms were observed in more than 91% of the patients, though neurological signs were present in 10% of the COVID-19 patients. Moreover, positive troponin, WBC≥15000, and a history of respiratory disease were the indicators of neurological signs.

Keywords : COVID-19; neurological manifestations; SARS-CoV-2

Count: 433
Abstract ID: 425
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

COVID-19 causes neuronal degeneration and reduces neurogenesis in human hippocampus

Submission Author: Reza Bahar

Reza Bahar[1], Abbas Aliaghaei[2]

1. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Recent investigations of COVID-19 have largely focused on the effects of this novel virus on the vital organs in order to efficiently assist individuals who have recovered from the disease.

Methods : In the present study we used hippocampal tissue samples extracted from people who died after COVID-19. Utilizing histological techniques to analyze glial and neuronal cells we illuminated a massive degeneration of neuronal cells and changes in glial cells morphology in hippocampal samples.

Results : The results showed that in hippocampus of the studied brains there were morphological changes in pyramidal cells, an increase in apoptosis, a drop in neurogenesis, and change in spatial distribution of neurons in the pyramidal and granular layer. It was also demonstrated that COVID-19 alter the morphological characteristics and distribution of astrocyte and microglia cells.

Conclusion : While the exact mechanism(s) by which the virus causes neuronal loss and morphology in the central nervous system (CNS) remains to be determined, it is necessary to monitor the effect of SARS-CoV-2 infection on CNS compartments like the hippocampus in future investigations. As a result of what happened in the hippocampus secondary to COVID-19, memory impairment may be a long-term neurological complication which can be a predisposing factor for neurodegenerative disorders through neuroinflammation and oxidative stress mechanisms.

Keywords : COVID-19 · Hippocampus · Degeneration · Glial cells · Sholl analysis

Count: 434
Abstract ID: 502
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

A narrative article on neuropsychological injuries during the Covid-19, focusing on the impact of virtual education on students' mental health

Submission Author: Homa Mehri

Mina Bayatsefidi[1], Nazanin Aghayee[2], Homa Mehri[3]

1. Department of Psychology, Faculty of Humanities, North Tehran Branch, Islamic Azad University, Tehran, Iran
2. Department of Psychology, Faculty of Psychology and Social Science, Rudehen Branch, Islamic Azad University, Tehran, Iran
3. * Medical Doctor, Department of Medicine, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran

Background and Aim : Background and Objective: In recent years, the spread of the Coronavirus (Covid-19) has caused many problems for people around the world. Apart from affecting the physical and mental health of people, these problems have caused changes in the implementation of some social processes such as education. For this reason, face-to-face teaching and learning gave way to non-face-to-face and virtual education

Methods : Materials and Methods: The present study was conducted with the aim of the effect of virtual education on the occurrence of psychological and neurological injuries during the outbreak of the Coronavirus in students. The current study is a review article and the collected materials are taken from research sites such as Google Scholar, ScienceDirect, PubMed, and SID.

Results : Finding: The results of the surveys show that virtual education has been associated with many problems for students and teachers, one of the most important of which was the damage it caused to the mental health of students. In general, after the start of quarantine and security measures, and school closures, students' communication with their teachers and peers decreased and this caused damage such as stress, anxiety, depression, and other mental disorders.

Conclusion : Conclusion: Although after the virtualization of education, the amount of students' use of the Internet increased, this situation increased the level of isolation and decreased interaction with each other. As a result, these factors caused a decrease in self-confidence in students and eventually increased some psychological injuries. It is recommended to take measures to prepare

virtual education infrastructures in schools, especially in students' homes, to familiarize parents with the process of this type of education, and make the role of psychologists and counselors more serious in schools.

Keywords : Keywords: Coronavirus; Virtual education; Neuropsychological injuries; Students; Mental health