Count: 1
Abstract ID: 90
subject: Cognition: Learning and Memory
Presentation Type: Poster

The effect of Intraventricular Injection of Kisspeptin-13 on Social Memory Deficits Induced by Methamphetamine Administration in Male Rats

Submission Author: Somayeh Nazari

Somayeh Nazari[1], Mobina Gheibi[2], Hamed Ghazvini[3], Raheleh Rafaiee[4], Mohammad Saleh Ranaiy[5], Seyedeh Masoumeh Seyedhosseini Tamijani[6]

1. Student Research Committee, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. Student Research Committee, Mazandaran University of Medical Sciences, Sari, Iran
3. epartment of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
5. Student Research Committee, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
6. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Methamphetamine is a stimulant of the central nervous system, which is now increasingly abused. Long-term use of this psychoactive drug is associated with many cognitive disorders, including learning and memory impairment. Kisspeptin-13 is one of the endogenous neuropeptides, whose neuroprotective role on cognitive functions, especially memory, was investigated in several studies. In the present study, the role of kisspeptin-13 in mitigating social memory impairment induced by methamphetamine was investigated.

Methods : This experimental study was carried out on 40 adult male Wistar rats weighing (200-270 g). This study was conducted with the code of ethics (IR.MAZUMS..REC.1398.6037) at the Neuroscience Research Center of Mazandaran University of Medical Sciences. In this study, the animals were randomly divided into four groups: control, methamphetamine,kisspeptin-13+ methamphetamine, and kisspeptin-13 groups. First, pretreatment with kisspeptin-13 was done intraventricularly for three days at a dose of 1.5 µg/µL in the respective groups. Specifically, on the initial day, the subjects were given a dose of 1 mg/kg twice, with a 4-hour interval. On the following day, the dosage was raised to 2 mg/kg, and this incrementally increased on subsequent days throughout the week. Thus, on the third day, the dose was 3 mg/kg, on the fourth day, the dose was 4 mg/kg, and on the fifth, sixth, and seventh days, the doses were 5 mg/kg, 6 mg/kg, and 7 mg/kg, respectively. After the injections, the social interaction behavioral test evaluates social memory and sociability. This test was carried out in a three-chambered device for ten minutes in a rectangular space that was divided into three parts. In the side chambers, there were two wire

chambers in which stranger and familiar rats were placed. On the test day, the time spent in each room was monitored

Results : The results of this investigation, which examined the effect of kisspeptin-13 on sociability and social memory in two stages, were as follows. The effect of kisspeptin -13 on sociability showed that the duration of exploration in the chamber where the first stranger mouse was placed was longer than the duration of exploration in the empty chamber in all experimental groups. Results indicated that sociability in these animals was not affected by the administration of methamphetamine, as well as kisspeptin -13, and all animals in the groups receiving the drug responded similarly to the control group. Statistical analysis regarding the effect of kisspeptin -13 on social memory showed that there is a significant statistical difference in the time spent for the first stranger mouse and the second stranger mouse, and the animals in the group receiving methamphetamine spent more time in social interaction with the first stranger mouse, which indicates damage to social memory, and the administration of kisspeptin -13 in animals receiving methamphetamine also failed to improve social memory. In the group receiving kisspeptin -13, social memory was not significantly different from the control group, which indicated that the administration of kisspeptin -13 alone does not lead to damage to social memory.

Conclusion : This study showed that methamphetamine can lead to serious impairment of social memory without causing a change in social interaction, and pretreatment with kisspeptin-13 could not compensate for the damage to social memory caused by the administration of methamphetamine

Keywords : Social memory, Social interaction, Methamphetamine, Kisspeptin-13, Intraventricular injection

Count: 2
Abstract ID: 91
subject: Cognition: Learning and Memory
Presentation Type: Poster

Neuroprotective effect of Rutin on neurobehavioral dysfunction and cognitive impairment-induced by methamphetamine in male rats

Submission Author: Somayeh Nazari

Somayeh Nazari[1], Mobina Gheibi[2], Hamed Ghazvini [3], Raheleh Rafaiee[4], Seyedeh Masoumeh Seyedhosseini Tamijani[5]

1. Student Research Committee, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
2. Student Research Committee, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
5. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Methamphetamine (Met) abuse is associated with neurobehavioral impairments, including antisocial behavior, anxiety, and cognitive deficits. Several studies have shown that Rutin, a flavonoid compound, has neuroprotective effects against behavioral and memory disorders

Methods : In this experimental study, the effects of pretreatment with Rutin on social behavior, anxiety-related behavior, and cognitive dysfunction induced by Met were evaluated. Methods: Male Wistar rats were pretreated with intraventricular injection of three different doses of Rutin (25, 50 or 150 nM) or saline 30 min prior to Met administration. Met (4×4 mg/kg) or saline was administered subcutaneously at 2 h intervals. Rectal temperature was measured 1 h after the last Met administration. Behavioral and cognitive evaluations, encompassing open field, Y-maze, social interaction, and elevated plus-maze assessments, were performed three days subsequent to the final injection to assess locomotor activity, spatial working memory, sociability and social memory, as well as anxiety-related behaviors, respectively

Results : Pretreatment with Rutin attenuated Met-induced hyperthermia and hyperlocomotion in rats. Rutin showed remarkable efficacy in ameliorating Met-induced social memory impairment, while sociability remained unchanged in the social interaction test. In addition, Rutin improved working memory impairment and reduced anxiety-related behaviors at concentrations of 50 and 150 nM in rats receiving Met

Conclusion : These findings suggest that Rutin exerts a neuroprotective effect against Met-induced neurobehavioral and cognitive deficits. Therefore, Rutin supplementation may be a promising therapeutic approach to mitigate Met-induced neurotoxicity.

Keywords : Methamphetamine,Rutin,Cognitive Impairments,Neurobehavioral Dysfunction

Count: 3
Abstract ID: 99
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Influence of Antihypertensive Drugs on Cognitive Function: An fMRI-Based Systematic Review of Memory and Emotion Regulation Mechanisms

Submission Author: Sama Rahnemayan

Sama Rahnemayan[1], Elham Mehdizadehfar[2], Arezoo Fathalizadeh[3]

1. Neurosciences Research Center (NSRC) of Tabriz University of Medical Sciences, Tabriz, Iran.
2. Neurosciences Research Center (NSRC) of Tabriz University of Medical Sciences, Tabriz, Iran.
3. Neurosciences Research Center (NSRC) of Tabriz University of Medical Sciences, Tabriz, Iran.

Conclusion : Antihypertensive medications, particularly losartan and propranolol, show significant promise in modulating cognitive functions, including memory encoding and emotional processing. These drugs offer potential therapeutic benefits for conditions such as PTSD, anxiety disorders, and addiction. While spironolactone and telmisartan also exhibit benefits in stress-related and mood disorders, further randomized clinical trials are needed to confirm these findings. Additionally, this review underscores the importance of fMRI in elucidating the neural mechanisms of cognitive dysfunction related to hypertension and optimizing treatment strategies.

Keywords : fMRI; antihypertensive medication; cognition; memory; emotional processing

Count: 4
Abstract ID: 161
subject: Cognition: Learning and Memory
Presentation Type: Poster

Mitochondrial Axonal Transport: Another Piece Of Alzheimer's Puzzle

Submission Author: Hamideh Asadinezhad

Hamideh Asadinezhad[1]

1. ph.D student of physiology, Department of physiology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Conclusion : INTRODUCTION: Alzheimer's is a progressive neurodegenerative disease affecting over 10 million people annually. While the exact cause remains elusive, research indicates that the accumulation of beta amyloid plaques plays a significant role in the disease's complexities. Recent studies suggest that disturbances in the axonal transport of mitochondria within nerve cells may be a reason of nervous disorder in this disease. METHOD: extraction of data from at least 16 articles utilized databases such as science direct, google scholar, medline, and pubmed, focusing on keywords: axonal transport, neurodegenerative diseases, Alzheimer, mitochondrial transport, cognitive impairment RESULT: axonal transport relies on three main factors: motor proteins, microtubules, and cargo, and disruption in any of these components can lead to impaired axonal transport. In Alzheimer's, mitochondrial distribution is disrupted, with healthy mitochondria less visible in axon ends and dendrites. As new mitochondria transport from the cell body to axon ends, and worn-out mitochondria return for digestion, disturbances in axonal transmission affect this vital process. Research in animals has shown a direct relationship between disruptions in the structure of kinesin and dynein (motor proteins) and incorrect mitochondrial distribution, alongside neuronal integrity issues and electrical message transmission disturbances. CONCLUSION: understanding axonal transfer factors as early indicators of the disease and their influence on mitochondrial distribution in Alzheimer's offers a promising avenue for treatment approaches. by targeting axonal transport mechanisms, interventions could potentially mitigate the progression of this debilitating neurodegenerative condition.

Keywords : Mitochondrial Axonal Transport; Alzheimer; neurodegenerative disease; kinesin; dynein

Count: 5
Abstract ID: 162
subject: Cognition: Learning and Memory
Presentation Type: Oral

The low and high doses administration of lutein improves memory and synaptic plasticity impairment through different mechanisms in a rat model of vascular dementia

Submission Author: Hamideh Asadinezhad

Hamideh Asadinezhad[1], Masoud Haghani[2]

1. M.Sc student of physiology, Department of physiology, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.
2. Professor of Physiology Department of Physiology, School of Medicine Histomorphometry and Stereology Research Center, Shiraz University of Medical Sciences

Background and Aim : Vascular dementia (VD) is a common type of dementia. This study aimed to evaluate the effects of low and high doses of lutein administration in bilateral-carotid vessel occlusion (2VO) rats.

Methods : The rats were divided into the following groups: the control, sham-, vehicle (2VO+V) groups, and two groups after 2VO were treated with lutein 0.5 (2VO+LUT-o.5) and 5mg/kg (2VO+LUT-5). The passive-avoidance and Morris water maze were performed to examine fear and spatial memory. The field-potential recording was used to investigate the properties of basal synaptic transmission (BST), paired-pulse ratio (PPR), as an index for measurement of neurotransmitter release, and long-term potentiation (LTP). The hippocampus was removed to evaluate hippocampal cells, volume, and MDA level.

Results : Treatment with low and high doses improves spatial memory and LTP impairment in VD rats, but only the high dose restores the fear memory, hippocampal cell loss, and volume and MDA level. Interestingly, low-dose, but not high-dose, increased PPR. However, BST recovered only in the high-dose treated group.

Conclusion : Treatment with a low dose might affect neurotransmitter release probability, but a high dose affects postsynaptic processes. It seems likely that low and high doses improve memory and LTP through different mechanisms.

Keywords : Vascular dementia; lutein; 2VO; LTP; synaptic plasticity

Count: 6
Abstract ID: 520
subject: Cognition: Learning and Memory
Presentation Type: Poster

Serotonergic Modulation of Inhibitory Avoidance Memory: Opposing Effects of bilateral post-training intra-prelimbic microinjections of 5-HT3 and 5-HT4 Receptor Agonists and Antagonists

Submission Author: Nargol Ahmadimahmoodabadi

Nargol Ahmadimahmoodabadi[1], Mohammad Nasehi[2], Masoumeh Emam Ghoreishi[3]

1. Department of Biology, Farhangian University, Tehran, Iran
2. Cognitive and Neuroscience Research Center (CNRC), Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran
3. Department of Pharmacology, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : The serotonergic system has often been defined as a neumodulator system, and specifically involved in learning and memory via its various receptors, but the specific mechanisms involved remain unclear. The present study aimed to investigate the possible effects of bilateral post-training intra-prelimbic (PL) microinjections of serotonergic 5-HT3 and 5-HT4 receptor agonists/antagonists upon inhibitory avoidance (IA) memory consolidation.

Methods : The step-through inhibitory avoidance (IA) task was used to assess memory in adult male Sprague-Dawley rats.

Results : The results indicated that sole intra-PL microinjections of m-CPBG (5-HT3 serotonin receptor agonist, 0.001, 0.01 and 0.1 µg/rat) impaired, whereas Y-25130 (a selective 5-HT3 serotonin receptor antagonist, 0.001 and 0.01 and 0.1 µg/rat) and RS23597-190 (a 5-HT4 receptor antagonist, 0.005, 0.01, 0.1 and 0.5 µg/rat) did not affect IA memory consolidation, by itself. In contrast, post-training bilateral intra-PL microinfusion of RS67333 (a 5-HT4 receptor agonist, 0.5 µg/rat) increased IA memory consolidation. However, none of the above interventions did not affect locomotor activity.

Conclusion : In conclusion, the present study demonstrated a complex role of the serotonergic system in the consolidation of inhibitory avoidance (IA) memory. Specifically, our findings suggested that 5-HT3 and 5-HT4 receptors in the prelimbic cortex (PL) exert opposing effects on memory formation.

Keywords : Pre-limbic cortex, Inhibitory avoidance memory, 5-HT3 receptor, 5-HT4 receptor

Count: 7
Abstract ID: 596
subject: Cognition: Learning and Memory
Presentation Type: Poster

Tetrahydrocannabinol (THC) and Its Impact on Memory Processing and Interaction Between Neurotransmitters

Submission Author: Keyvan Kiani

Keyvan Kiani[1], fatemeh abdolhoseynzade reweshti[2], farzaneh teymoori gharb[3]

1. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : Objective: Synaptic Plasticity, refers to the alterations in synaptic strength due to repetitive experiences, essential for learning and memory. LTP is characterized by an enhancement of excitatory transmission from frequent synaptic activities, while LTD indicates a prolonged decrease in excitatory transmission. Both processes are particularly evident in the hippocampus, critical for memory consolidation. The endocannabinoid system operates through two G-protein-coupled receptors (GPCRs), CB1R and CB2R. THC, psychoactive compound in cannabis, influences cognitive functions by interacting with these receptors. CB1R is highly expressed in brain regions related to emotionality, cognition, and memory. The impact of THC on memory is multifactorial and depends on the dosage, timing, formula, and route of consumption.THC exerts its effects on memory in two main ways: 1. Direct Impact: It impairs short-term memory by disrupting neurotransmitter release critical for neural communication. CB1R activation can impair both LTP and LTD by reducing presynaptic neurotransmitter release and then evoking a reduced postsynaptic response in NMDARs. THC disturbs encoding processes in the hippocampus and frontal cortex. Long-term exposure to THC appears to reduce CB1 sensitivity to GABAergic instead of glutamatergic agonists. 2. Indirect Influence:THC alters the balance of neurotransmitters involved in memory processing, which affects synaptic plasticity. This impairment lead to difficulties in forming new memories and recalling existing ones. 1. Glutamate:CB1 plays a pivotal role in modulating glutamatergic neurotransmission, influencing both presynaptic and postsynaptic mechanisms. Activation of CB1 receptors primarily inhibits glutamate release by reducing calcium influx via voltage-gated calcium channels. However, chronic THC exposure may paradoxically enhance glutamate release and disrupt receptor expression, particularly of AMPA and NMDA receptors. CB1 activation alters intracellular signaling pathways, including MAPKs and cAMP. 2. Glycine : co-agonist at NMDA receptors, crucial for synaptic plasticity. THC disrupt glycinergic signaling, affecting NMDA receptor function and memory processes. 3. Serotonin:Modulates memory encoding and retrieval through various receptor subtypes. Activation of CB1 can alter the activity of serotonergic neurons, leading to changes in serotonin release and signaling pathways. 4. GABA:THC reduce CB1R-mediated GABA release from CA1 pyramidal neurons and inhibit GABAAR-mediated inhibitory postsynaptic currents. The

interplay of CB1 and GABAB receptors has been documented during memory processing within the hippocampal formation proposing a practical interconnection between these two systems to modulate synaptic plasticity 5. Dopamine:THC enhance dopamine release in mesolimbic, mesocortical, and nigrostriatal pathways, potentially distracting from cognitive tasks while impairing working memory. 6. ACh:THC can prevent ACh release in the hippocampus. THC at low doses can intensify the released amount of ACh into the hippocampal and prefrontal synaptic clefts. An increase in the ACh amount at the synaptic cleft, recovers spatial memory deficit. Summary:THC interacts with several neurotransmitter systems, complicating its effects on memory. While primarily an impairing agent, its interactions with neurotransmitters like Glutamate, glycine, GABA, dopamine, serotonin, and Ach illustrate the complexity of THC's cognitive effects. It is essential to consider both therapeutic potentials and cognitive risks associated with THC consumption, as further research is needed to fully elucidate these interactions.

Keywords : Tetrahydrocannabinol; Memory Processing; Neurotransmitters

Count: 8
Abstract ID: 196
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Impact of Soy Extract on Spatial Learning and Memory Impairment Caused by Global Ischemia in Ovariectomized Rats.

Submission Author: Azim Zaeimbashi

Azim Zaeimbashi[1], Farzaneh Vafaee[2], Mahmoud Hosseini[3], Hamid Reza Sadeghinia[4], Mosa Al-Reza Hadjzadeh[5], Mohammad Soukhtanloo[6], Motaharah Rahimi[7]

1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran. Department of Neuroscience, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
2. Neurocognitive Research Center, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.
3. Neurogenic Inflammation Research Center, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.
4. Pharmacological Research Center of Medicinal Plants and Department of Pharmacology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.
5. Neurocognitive Research Center, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.
6. Department of Biochemistry, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.
7. Neurocognitive Research Center, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Postal Code 9177948564, Iran.

Background and Aim : The influence of soy extract on memory and oxidative damage to brain tissue caused by ischemia was studied in ovariectomized (OVX) rats.
Methods : The rats were categorized into six groups: 1) Sham; 2) OVX; 3) Sham-Ischemia; 4) OVX-Ischemia; 5) OVX-Ischemia-S 20; and 6) OVX-Ischemia-S 60. The common carotid artery was occluded for 30 minutes and then re-perfused. The OVX-Ischemia-S 20 and OVX-Ischemia-S 60 groups were administered either 20 or 60 mg/kg of soy extract for eight weeks prior to the ischemic event.
Results : The Sham-Ischemia and OVX-Ischemia groups took longer to reach the platform and spent less time in the target quadrant (Q1) compared to the Sham and OVX groups. In contrast, the OVX-Ischemia-S 20 and OVX-Ischemia-S 60 groups exhibited shorter escape latencies and spent more time in Q1 than the OVX-Ischemia group. No significant differences were observed among the groups in the rotarod test. Additionally, the hippocampal levels of malondialdehyde (MDA) were higher in the Sham-Ischemia and OVX-Ischemia groups than in the Sham and OVX groups. Pre-treatment with 20 and 60 mg/kg of soy extract led to a reduction in MDA levels.
Conclusion : It is indicated that soy extract may help prevent memory impairment and oxidative damage to brain tissue caused by ischemia in OVX rats.
Keywords : soy, ischemia, ovariectomy, rat, memory, learning, malondialdehyde

Count: 9
Abstract ID: 462
subject: Cognition: Learning and Memory
Presentation Type: Poster

Carvacrol has protective effects on inflammation and oxidative stress in brain tissue, and it also improves learning and memory in rats challenged with lipopolysaccharide

Submission Author: Zohreh Arab

Zohreh Arab[1], Mahmoud Hosseini[2], Zahra Hakimi[3]

1. Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
3. Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Inflammation can cause memory impairment. In the present study, the effect of carvacrol on brain tissue inflammation and oxidative stress as well as learning and memory in lipopolysaccharide (LPS)-challenged rats was evaluated.

Methods : The animals were grouped and treated: (1) control which received vehicle instead of LPS and carvacrol, (2) LPS (1 mg/kg; i.p. 120 min before behavioral tests), and (3–5) in these groups, 25, 50, or 100 mg/kg of carvacrol (i.p.) was administered 30 min prior to LPS.

Results : In a Morris water maze test, compared to LPS group, administration of all three doses of carvacrol shortened the elapsed time and the traveled distance to find the platform, while it prolonged the traveled time in the target area. In a passive avoidance test, administration of all 25, 50, and 100 mg/kg carvacrol significantly increased the latency at the 3 h, 24 h, 48 h, and 72 h after the shock compared to the LPS group. Interleukin (IL)-6, malondialdehyde (MDA), and NO (nitric oxide) metabolites were increased in the brain by LPS injection, while thiol, superoxide dismutase (SOD), and catalase (CAT) were decreased. Pretreatment with carvacrol reduced IL-6, NO metabolites, and MDA, while it improved thiol content, CAT, and SOD.

Conclusion : The results indicated that carvacrol protected from learning and memory impairment and the brain tissue inflammation and oxidative stress in LPS-challenged rats.

Keywords : Learning .Memory .Lipopolysaccharide .Carvacrol .Cytokines .Oxidative stress

Count: 10
Abstract ID: 738
subject: Cognition: Learning and Memory
Presentation Type: Poster

Probiotic supplementation restores behavioral deficits induced by prenatal stress

Submission Author: Fatemeh Aghighi

Fatemeh Aghighi[1], Sayyed Alireza Talaei[2], Mahmoud Salami[3]

1. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.
2. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.
3. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.

Background and Aim : Pregnancy is regarded as an important event during woman's life. Specifically, there is now well-documented evidence that adversity in this period increases the risk for development of personality disorders, major depression, posttraumatic stress disorder, anxiety and addictive disorders. Studies demonstrate that damage to gut microbiota is associated with some brain disorders. This study was designed to test and verify whether probiotics can repair behavioral impairment in offspring rats induced by prenatal stress.

Methods : Study was carried out on the male Wistar rats. Offspring were divided into four groups: Control rats, and prenatal stressed rats were orally received 1 ml normal saline, or 1 ml probiotics mixture contained Bifidobacterium longum, Lactobacillus acidophilus, Bifidobacterium bifidum, and Lactobacillus fermentum (103 CFU of each) daily. Pregnant rats throughout pregnancy were subjected to a regimen of chronic unpredictable stressors. After weaning at postnatal day 22, experimental offspring were orally received 1 ml normal saline, or 1 ml probiotics mixture for one month. Finally, anxiety, learning and memory evaluated in the passive avoidance test and zero maze respectively.

Results : Our findings showed that prenatal chronic unpredictable stress exposure promotes anxiety and probiotic treatment restores the destructive effects of prenatal stress exposure. Our data in passive avoidance test also showed that prenatal chronic unpredictable stress reduced step-through latency in animals. However, administration of probiotic led to increased step-through latency in prenatal stress rats.

Conclusion : Our finding showed that administration of probiotics improves behavioral performances impaired by prenatal chronic unpredictable stress in rats.

Keywords : Chronic unpredictable stressors; Pregnancy; Probiotic, Anxiety; Learning and memory; Rats

Count: 11
Abstract ID: 739
subject: Cognition: Learning and Memory
Presentation Type: Poster

Evaluating effect of probiotic supplementation on LTP induction in the CA1 area of hippocampus of prenatally stressed rats

Submission Author: SayyedAlireza Talaei

SayyedAlireza Talaei[1], Fatemeh Aghighi[2], Mahmoud Salami[3]

1. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.
2. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.
3. Physiology Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, I.R. Iran.

Background and Aim : Chronic maternal stress during pregnancy can have long-term, detrimental consequences for the offspring. Evidence shows that prenatal stress negatively affects cognitive functions and activity of neuronal circuits in postnatal age. In recent years, the gut microbiota has been well investigated for its role in regulating enteric and central nervous system functions. Probiotics are defined as “live, micro-organisms, which induces a health benefit to the host when administered in adequate amounts Probiotics may affect mental health like cognition and stress via the gut–brain axis. Since the hippocampus is highly sensitive to stress as well as postnatal development, we asked if prenatal stress and probiotic treatment impact on electrophysiological aspects of learning and memory.

Methods : Study was carried out on the male Wistar rats. Probiotics mixture contained Bifidobacterium longum, Lactobacillus acidophilus, Bifidobacterium bifidum, and Lactobacillus fermentum (103 CFU of each). Pregnant rats throughout pregnancy were subjected to a regimen of chronic unpredictable stressors. Offspring were divided into four groups: Groups of the prenatal stressed animals remained intact (ST) or received probiotic (SP) from postnatal day 22 for one month. The control groups were intact (CO) or received probiotic (CP) from postnatal day 22 for one month. Basic synaptic activity and long-term potentiation induction were assessed in the CA3-CA1 pathway of hippocampus

Results : The prenatal chronic unpredicted stress significantly decreased the synaptic activity. The postnatal probiotic treatment significantly affected the mean amplitude of fEPSPs in both the control and prenatally stressed rats.

Conclusion : Probiotic supplementation can improve disrupted synaptic plasticity in the prenatal chronic unpredicted stress rats.

Keywords : Prenatal chronic unpredictable stressor; Probiotic; Synaptic plasticity; Rats

Count: 12
Abstract ID: 350
subject: Cognition: Learning and Memory
Presentation Type: Oral

Investigation of behavioral changes following Risperidone and Aripiprazole treatment in schizophrenia-like induced by Ketamine in rats

Submission Author: Mobin Naderi

Mobin Naderi [1], Hamed Ghazvini[2], Amir Maleksabet[3], Hossein Ghalehnoei[4]

1. Student research committee, School of advanced technologies in medicine, Mazandaran university of medical sciences, Sari, Iran
2. 2. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. 3. Department of Medical Biotechnology, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. 3. Department of Medical Biotechnology, Faculty of Advanced Technologies in Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Schizophrenia is a chronic and severe neurodevelopmental disorder marked by a significant degree of heritability and a complex interplay of genetic and neurobiological factors. The symptoms of schizophrenia encompass positive, negative, and cognitive dimensions. Antipsychotic medications serve as the primary treatment for this condition. This study aims to evaluate the effects of two antipsychotic drugs—Risperidone (RIS) and Aripiprazole (ARI)—on schizophrenia-like behaviors induced by Ketamine in rats.

Methods : A total of 40 male Wistar rats (weighing between 200-300 grams) were randomly divided into five groups: control, vehicle (received saline), ketamine (30 mg/kg), aripiprazole (0.75 mg/kg), and risperidone (1 mg/kg). RIS and ARI were dissolved in sterile normal saline solution (0.9% NaCl). The ketamine, risperidone, and aripiprazole groups received ketamine at a dose of 30 mg/kg for 10 consecutive days. Twenty-four hours after the final ketamine dose, the RIS and ARI groups received their respective treatments for 14 days. All drugs were delivered via intraperitoneal (I.P.) injection. Following the last injection of ketamine and normal saline, various behavioral tests were conducted: the Social Interaction Test (SIT), Open Field Test (OFT), Novel Object Recognition (NOR), and Elevated Plus Maze (EPM).

Results : One-way ANOVA analysis indicated that exposure to ketamine resulted in deficits in social interaction and novel object memory. Furthermore, the findings demonstrated a significant increase in anxiety-like behavior among animals that received ketamine. Conversely, treatment with RIS and ARI ameliorated the impairments in social interaction ($P < 0.0001$) and novel object memory. Additionally, anxiety-like behavior was notably reduced in rats treated with RIS and ARI compared to those in the ketamine group. Moreover, the ARI administration resulted in a more significant decrease in anxiety-like behavior compared to the RIS group ($P < 0.05$) and had a more advantageous impact in the NOR test ($P < 0.05$).

Conclusion : The current research indicates that administering antipsychotic medications such as RIS and ARI can mitigate schizophrenia-like symptoms induced by ketamine. Numerous studies have underscored the beneficial effects of RIS and ARI on schizophrenia, and this investigation corroborates those findings. However, further research is warranted to explore the effects of these medications more comprehensively, as this area represents a critical avenue for advancing treatment strategies for schizophrenia.

Keywords : Schizophrenia; Risperidone; Aripiprazole; Ketamine

Count: 13
Abstract ID: 216
subject: Cognition: Learning and Memory
Presentation Type: Poster

To study the effect of forced Running Wheel exercise on the cognitive memory and the levels of BDNF in the hippocampus and prefrontal cortex of ovariectomized rats exposed to stress

Submission Author: Arvin Amiri

Arvin Amiri[1], Simin Ehsani vostacolaee [2], Mohadeseh Molaee [3], Seyedeh Rose Jamali [4], Sakineh Shafia [5]

1. Department of veterinary medicine, Faculty of veterinary medicine, Babol Branch Islamic Azad University, babol, Iran
2. Department of Physiology Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
3. Department of Physiology Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
4. . Department of Biology, Faculty of biotechnology, Babol Branch Islamic Azad University, babol, Iran
5. . Department of Physiology, Immunogenetics research center, Mazandaran university of Medical sciences, sari, Iran.

Background and Aim : Unpredictable stressors cause changes in behavioral parameters such as motor and exploratory behaviors, feeding, and sexual and anxiety behaviors and neurotrophic factors. Stress leads to the release of corticosteroids and, as a result, causes dysfunction in different parts of the nervous system. Post-Traumatic Stress Disorder (PTSD) is a chronic mental health condition that arises following exposure to traumatic stress, such as war, assault, or natural disasters. This disorder is characterized by alterations in the functioning of brain regions such as the hippocampus, prefrontal cortex, and autonomic nervous system and leading to increased anxiety and reduced cognitive performance. Both PTSD and menopause are associated with an increased risk of mental disorders such as anxiety and reduced cognition memory. These disorders occur due to changes in the functioning of the brain regions and a decrease in neurotrophic factors such as BDNF and IGF-1. Research has shown that exercise can significantly improve mental and cognitive disorders through improvement in neurotrophic factors synthesize. The aim of this study is to investigate the effect of Forced Running Wheel exercise on cognition memory, and IGF-1 as a neurotrophic factor in the hippocampus and prefrontal cortex of ovariectomized rats

Methods : : Single prolonged stress (SPS) was used as a model to induce PTSD. The Female adult rats were divided into two groups: Ovariectomy and Control. Each group was further divided into SPS and Non-SPS groups. After 10 days, each group was subdivided into two: 1) sedentary, and 2) Forced exercise groups. In the forced exercise group, exercise was performed for 4 weeks, 5 days a week, for 30 minutes per day at a speed of 10 meters per minute. At the end of the exercise period, cognition memory was assessed using the Object Recognition Memory Test (ORMT). After the behavioral test, the animals were deeply anesthetized and

sacrificed. The brain was then rapidly removed and the Hippocampus& prefrontal cortex was frozen in -20°c for BDNF levels measurement using ELISA kit.

Results : This study showed that the SPS method led to a significant decrease in cognition memory, and a reduction in BDNF levels in the hippocampus and prefrontal cortex of female rats in both the control and ovariectomized groups. Forced Running Wheel exercise improved the molecular disturbances induced by SPS in the control and ovariectomized groups, but in the ovariectomized rats, this improvement in Discrimination Index was only observed in the Non-SPS group, therefore this exercise program did not significantly ameliorate the stress-induced behavioral impairment in SPS group.

Conclusion : These findings indicate that Forced Running Wheel exercise for 4 weeks (10 m/min) can play an important role in increasing neurotrophic factor, although its effect on recognition memory in ovariectomized rats under severe stress requires further studies. Results of this research could contribute to the development of new therapeutic methods for improving disorders caused by PTSD and menopause. Additionally, this study may provide new insights into the underlying mechanisms of the impact of exercise on mental and cognitive health.

Keywords : Post-Traumatic Stress Disorder; Prefrontal Cortex, Hippocampus, Forced Running Wheel exercise, BDNF, ORMT

Count: 14
Abstract ID: 501
subject: Cognition: Learning and Memory
Presentation Type: Poster

Physical and cognitive Training alleviate ischemia-induced memory impairment by reducing apoptosis in hippocampus

Submission Author: Fatemeh Farokhi-Sisakht

Fatemeh Farokhi-Sisakht[1], Saeed Sadigh-Eteghad[2], Gisou Mohaddes[3], Mehdi Farhoudi[4]

1. Student Research Committee, Yasuj University of Medical Sciences, Yasuj, Iran
2. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
3. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
4. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : This study investigated the effects of physical and cognitive training on memory impairment and apoptosis markers in a rat model of hippocampal ischemia.

Methods : Ischemia was induced by bilateral injection of endothelin-1 into the hippocampus. Rats in the training groups were exposed to voluntary running wheel exercise, modified Barnes maze cognitive task, or a combination of these interventions for 4 weeks. Spatial memory was assessed using the Morris water maze. Western blotting was used to evaluate the expression of cytochrome c, Bax, Bcl-2, and cleaved caspase-3 proteins in the hippocampus.

Results : Endothelin-1 significantly impaired learning and memory in the spatial memory task and increased the expression of apoptotic proteins. However, the interventions remarkably improved spatial memory performance and reduced apoptotic protein levels in the hippocampus of ischemic rats.

Conclusion : These findings showed that physical activity and cognitive training may protect against ischemia-induced memory impairment by reducing apoptosis.

Keywords : Physical training; cognitive training; Hippocampal ischemia; Memory; Apoptosis

Count: 15
Abstract ID: 202
subject: Cognition: Learning and Memory
Presentation Type: Poster

To Study the effect of physical activity on the tissue structure of the hippocampus (Golgi staining) and cognitive memory, BDNF levels in the prefrontal cortex and fear extinction in male SPS rats.

Submission Author: Seyedparsa Seyedpour

Seyedparsa Seyedpour[1], Mehrzad Mardani [2], Pardis Seyedpour [3], Nadia Abedi [4], Sakineh Shafia [5]

1. Department of Medical Engineering. Electrical engineering, Hadaf Institute of Higher Education, Sari, Iran
2. Medical Student, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Master's degree in general psychology,Sarve Counseling and Psychology Center , Sari, Iran
4. PhD student, Department of animal sciences, Faculty of biological sciences, Kharazmi University, Karaj, Iran
5. Associated Professor, Immunogenetics Research Center, Department of Physiology, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Post-traumatic stress disorder (PTSD) is a chronic mental illness that usually occurs after a traumatic event. Chronic stress increases the activity of microglial cells, resulting in the loss of Dendritic spines in the medial prefrontal cortex and hippocampus. Additionally, fear extinction is impaired after stress exposure, leading to the inability to replace new memories with previous disturbing ones. The pathophysiology of PTSD involves changes in specific anatomical regions and circuits of the brain. Medications for psychotic disorders have side effects, and there is a risk of relapse in some patients. Exercise, as an adjunctive treatment, may improve the structural and functional changes caused by stress. Our aim in this study was to investigate the effect of intense exercise in an animal model of PTSD on the change of anxiety level and BDNF and IGF-1 factors.

Methods : In this experiment, Wistar male laboratory rats and a single prolonged stress animal model were used as valid models for PTSD induction. Following a 4-week exercise intervention on a treadmill (treadmill exercise at moderate intensity) — the first two weeks at a speed of 10 m/min for half an hour a day and the second two weeks at a speed of 15 m/min for half an hour a day, 5 days per week — cognitive memory and fear extinction were evaluated using behavioral tests (ORMT and Extinction). The animals were then euthanized under deep anesthesia with ketamine and xylazine. The brains were removed, and the hippocampus was fixed for histological studies using the Golgi staining method. The prefrontal cortex was also frozen at -20°C for BDNF measurement.

Results : The results of this study showed that rats suffering from PTSD exhibited a decrease in fear extinction (the ability to forget disturbing memories), an increase in freezing behavior, a reduction in cognitive memory, a decrease in BDNF levels in the prefrontal cortex, and a reduction in dendritic branches. The selected exercise program significantly improved

behavioral deficits (cognitive memory and fear extinction) and reduced freezing behavior as a measure of fear. Additionally, BDNF levels in the prefrontal cortex increased, and a relative increase in dendritic branches in the hippocampus was observed after the exercise protocol.

Conclusion : A regular 4-week course of moderate-intensity exercise can improve the structural and functional damage caused by stress in an animal model of PTSD, particularly in the hippocampus and prefrontal cortex, as well as ameliorate deficits in cognitive memory and reduce fear responses.

Keywords : Post-traumatic stress disorder, cognitive memory, fear extinction, Golgi staining, brain-derived neurotrophic factor

Count: 16
Abstract ID: 135
subject: Cognition: Learning and Memory
Presentation Type: Poster

The Effect of Coenzyme Q10 on Cognitive Impairments and Cue-related Reinstatement in Morphine-Dependent Rats

Submission Author: Mobina Gheibi

Mobina Gheibi[1]

1. Student Research Committee, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Opioid dependence significantly disrupts cognitive activities such as learning and memory, which may be the reason for a return to drug use. Morphine (MOR) can increase oxidative damage in the brain. We aim to investigate the effect of coenzyme Q10 (CoQ10) on cognitive impairment and cue-related reinstatement in MOR-dependent rats.

Methods : In this study, 40 male Wistar rats (200-220g) were divided into 5 experimental groups (n=8) as follows: Oil group, MOR+Oil group, MOR+Q10-100 group, MOR+Q10-200 group, MOR+Q10-400 group. The rats were administered increasing doses of MOR (25 to 100mg/kg, s.c.) once daily. After 21 days of addiction, CoQ10 treatment is administered by gavage at doses of 100, 200 and 400 mg/kg once daily for one month. CoQ10 is dissolved in 1 cc of sesame oil and administered. Behavioral assessments were performed using a novel object recognition test, working memory in the Y-maze, social interaction, and conditioned place preference. Expression of BDNF was assessed in the hippocampus by immunohistochemistry.

Results : Treatment with CoQ10 at a dosage of 100, 200 and 400 mg/kg within 4 weeks resulted in a significant improvement in the NOR task ($P<0.01$, $P<0.001$), working memory in the Y-maze ($P<0.01$, $P<0.001$), social interaction ($P<0.001$), cue-related reinstatement in the CPP ($P<0.01$, $P<0.001$) and significantly increased expression of BDNF ($P<0.001$) in the hippocampus.

Conclusion : : CoQ10 could improve cognitive impairment and reduce reinstatement in MOR-addicted male rats. Histologic examination confirmed the neuroprotective effects of CoQ10 in the hippocampus. CoQ10 could be a potential therapeutic agent for MOR-induced cognitive impairment and relapse.

Keywords : coenzyme Q10 ; morphine ; addiction

Count: 17
Abstract ID: 295
subject: Cognition: Learning and Memory
Presentation Type: Poster

Toll Like Receptor 1/2 Postconditioning by the Ligand Pam3cys inhibits memory impairment after traumatic brain injury in rats

Submission Author: Mahbobeh Kamranimehni

Mahbobeh Kamranimehni[1], Mohamamd sayyah[2], Morteza Zendehdel[3]

1. Department of Physiology, Faculty of Veterinary Medicine University of Tehran, Tehran, Iran.
2. Department of Physiology and Pharmacology, Institute Pasteur of Iran, Tehran, Iran
3. Department of Physiology, Faculty of Veterinary Medicine University of Tehran, Tehran, Iran.

Background and Aim : Background and aims: Traumatic brain injury (TBI) which causes cognitive impairments has a devastating impact on TBI survivors. Finding a neuroprotective strategy to rescue patients suffering from acute brain damage is of great interest. TLR1/2 agonist tri-palmitoyl-S-glyceryl-cysteine (Pam3cys) demonstrates promising neuroprotective effects. Pam3cys is a vaccine adjuvant that is confirmed to be safe for humans. We investigated the effects of Pam3cys on spatial memory, and neuronal survival in rat brains following mild-to-moderate TBI.

Methods : Methods: To determine the effects of Pam3cys, animals were first trained to locate a hidden platform 5-day learning period in a water maze. followed by mild TBI induction and post-conditioning Pam3cys or PBS (1 µg/5µl per rat) was injected unilaterally into the left cerebral ventricle of male rats 20 minutes after controlled cortical impact (CCI: 4.5 mm/sec velocity, 2 mm depth, 5 mm diameter)) injury.7 and 28 days post-TBI the rats were tested in probe trials to assess Spatial memory for the location in the maze that previously housed the platform. Nissl staining were used to assess nuerodegeneration in different groups.

Results : Results:¬¬ Our data showed that Morris water maze testing demonstrated that spatial learning and memory (overall mean the time to reach the platform and the distance traveled) decreased during the training days in all groups. A single administration of Pam3cys shortly after mild TBI significantly improved the spatial memory deficit at 7 and 28 days after TBI. Pam3cys prevented the neuronal loss induced by TBI in the hippocampus. Intergroup differences were assessed by graphpad prism ($P < 0.05$).

Conclusion : Conclusion: In summary, CCI produced significant long-term impairment of motor, memory, and behavioral performance measures, and Pam3cys administration, under the conditions used improved spatial reference memory in TBI rats in both 7 and 28 days after CCI.

Keywords : CCI, Pam3cys, Morris water maze, spatial memory, Rat

Count: 18
Abstract ID: 154
subject: Cognition: Learning and Memory
Presentation Type: Poster

Examining the impact of Pam3cys on the spatial memory capabilities of rats

Submission Author: Mahbobeh Kamranimehni

Mahbobeh Kamranimehni[1], Mohamamd sayyah[2]

1. Department of Physiology, Faculty of Veterinary Medicine University of Tehran, Tehran, Iran.
2. Department of Physiology and Pharmacology, Institute Pasteur of Iran, Tehran, Iran

Background and Aim : Pam3cys is a weak agonist of toll-like receptors type 1 and 2 and is able to inhibit learning and memory impairment in an animal model of Alzheimer's disease by inhibiting the secretion of inflammatory cytokines and increasing the secretion of anti-inflammatory cytokines. This arrangement is effective in improving memory performance. Considering the improving effect of Pam3cys on learning and memory impairment of Alzheimer's disease in an animal model, in this study, the effect of Pam3cys drug alone on the spatial memory of rats was investigated.

Methods : In this experimental study, 48 male Wistar rats (age, 45-days old; weight, 220-270g) were randomly divided into six groups (n = 8) as follows: There were two control groups of 7 and 28 days, two sham groups of 7 and 28 days, and two drug groups of 7 and 28 days. The spatial memory learning process of all mice was done using the Morris water maze for five days and four training sessions every day to find the hidden platform. At the last day of the learning period, the drug was injected intraventricularly with phosphate buffer (sham group) or Pam3cys (1 µg/5µl per mouse). 7 and 28 days after the injection, the memory of the rats was measured by measuring the time, speed and distance traveled in the target quarter of the maze.

Results : In the learning phase, there was no significant difference between the groups in terms of the time spent and the distance traveled in the target quarter of the circle. At 7 and 28 days after the learning period, there was no significant difference between the groups in terms of memory recall between the group of animals that received Pam3cys and the group of control animals as well as sham animals without receiving the drug (P>0.05).

Conclusion : In the present study, it can be said that Pam3cys with a dose of 1 microgram per microliter has no effect on the spatial memory performance of rats in short and long term. Also, due to the lack of effect on healthy rats, it can be used as a safe medicine in disease conditions.

Keywords : Pam3cys, spatial memory, Morris water maze, Rat

Count: 19
Abstract ID: 525
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effect of sleep deprivation on cognitive functions in rats

Submission Author: Mahdi Khanmohammadi

Mahdi Khanmohammadi[1], Elmira Beirami[2], Neda Valian[3], Samaneh Nabavi Fard[4]

1. -
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Sleep is a complex and essential biological function that plays a critical role in maintaining physical and mental health. It involves a regulated cycle of brain activity that includes different stages, such as rapid eye movement (REM) and non-REM sleep, each of which contributes to different physiological processes. Sleep is crucial for cognitive functions, emotional regulation, and overall well-being. It supports memory consolidation, learning, and the maintenance of neural plasticity. Despite its essential role in health, the increasing prevalence of sleep disorders has become a major concern in modern society, with sleep deprivation emerging as one of the most widespread and worrying problems. The aim of this study was to investigate the effect of sleep deprivation on cognitive functions in male Wistar rats.

Methods : In this study, the rats were divided into 3 groups: control (rats without sleep deprivation), sham (rats placed on a metal plate located on the columns of the apparatus), and sleep deprived (rats placed on the columns of the apparatus). To induce the sleep deprivation model, the 14-column multi-platform apparatus was used. Rats were placed on the columns of the apparatus from 4 pm to 10 am for 21 days. Novel object recognition (NOR) and passive avoidance (PA) tests were conducted to assess recognition memory and avoidance memory in rats.

Results : The results of the NOR test showed that the sleep-deprived group had more pronounced long-term memory impairments than the control group. Similarly, the PA test showed that the sleep-deprived group had weaker avoidance memory than the control group.

Conclusion : Overall, the study concluded that prolonged sleep deprivation had a significant impact on cognitive function, leading to increased cognitive impairment.

Keywords : Sleep deprivation, Novel object recognition test, Passive avoidance test, Rats

Count: 20
Abstract ID: 193
subject: Cognition: Learning and Memory
Presentation Type: Oral

Neural Stem Cells Secretome Increased Neurogenesis and Behavioral Performance and the Activation of Wnt/β-Catenin Signaling Pathway in Mouse Model of Alzheimer's Disease

Submission Author: Farzane Hijroudi

Farzane Hijroudi[1], Reza Rahbarghazi[2], Saeed Sadigh-Eteghad[3], Gozal Bahlakeh[4], Mohammad Karimipour[5]

1. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
2. Stem Cell Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Anatomical Sciences, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
5. Department of Applied Cell Sciences, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Alzheimer's disease is a progressive and age-related neurodegenerative disorder that is manifested by neuropathological changes and clinical symptoms. Recently, cell-based therapeutic interventions have been considered as the promising and efective strategies in this feld. Herein, we investigated therapeutic efects of neural stem cell secretome on Alzheimer's disease-like model by triggering of Wnt/β-catenin signaling pathway.

Methods : In this study, mice were randomly allocated into three diferent groups as follows: Control, AD+Vehicle, and AD+NSCs-CM groups. To induce mouse model of AD, Aβ1-42 was injected into intracerebroventricular region. Following AD-like confrmation through thiofavin S staining and Passive avoidance test, about 5 µl mouse NSCs-CM was injected into the target areas 21 days after AD induction. For evaluation of endogenous proliferation rate (BrdU/Nestin+ cells), 50 µg/kbW BrdU was intraperitoneally injected for 5 consecutive days. To track NSC diferentiation, percent of BrdU/NeuN+ cells were monitored via immunofuorescence staining. Histological Nissl staining was done to neurotoxicity and cell death in AD mice after NSCs-CM injection. Morris Water maze test was performed to assess learning and memory performance

Results : Data showed that NSCs-CM could reverse the learning and memory defcits associated with A? pathology. The reduced expression of Wnt/?-catenin-related genes such as PI3K, Akt, MAPK, and ERK in AD mice was increased. Along with these changes, NSCs-CM suppressed overactivity of GSK3? activity induced by A? deposition. Besides, NSCs increased BrdU/Nestin+ and BrdU/NeuN+ cells in a paracrine manner, indicating prolifera?tion and neural diferentiation of NSCs. Moreover, neurotoxicity rate and cell loss were deceased after NSCs-CM injection.

Conclusion : In summary, NSCs can regulate adult neurogenesis through modulating of Wnt/β-catenin signaling pathway and enhance the behavioral performance in the AD mice. These data present the alternative and efective approach in the management of AD and other cognitive impairments.

Keywords : NSCs condition medium · Neurogenesis · Learning and memory function · Wnt/β-catenin · Alzheimer disease

Count: 21
Abstract ID: 251
subject: Cognition: Learning and Memory
Presentation Type: Oral

Potential neuroprotective effect of nanomicellar curcumin on learning and memory functions following subacute exposure to bisphenol A in adult male rats

Submission Author: Mahmoud Gorji-Valokola

Mahmoud Gorji-Valokola[1]

1. Yazd Faculty of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

Background and Aim : Background and Aims: Bisphenol A (BPA) is an endocrine-disrupting chemical commonly utilized in the manufacture of plastics, which may cause damage to brain tissue. Curcumin is a phytochemical with protective effects against neurological and mental diseases. The purpose of this research was to evaluate whether nanomicellar curcumin (NmCur) might protect rats against BPA-induced learning and memory deficits.

Methods : Materials and Methods: After determining the proper dose of BPA, the animals were randomly divided into 8 groups (8 rats in each group) receiving dextrose 5% (as vehicle of NmCur) (Dex), sesame oil (as vehicle of BPA) (Sea), Sea plus Dex, NmCur (50 mg/kg), BPA (50 mg/kg), and 50 mg/kg BPA plus 10, 25, and 50 mg/kg NmCur groups, respectively. Behavioral tests performed using passive avoidance training (PAT), open-field (OF), and Morris water maze (MWM) tests. The expression of oxidative stress markers, proinflammatory cytokines, oxidative stress-scavenging enzymes, glutamate receptors, and MAPK and memory-related proteins was measured in rat hippocampus and cortical tissues.

Results : Results: BPA up-regulated ROS, MDA, TNF-α, IL-6, IL-1β, SOD, GST, p-P38, and p-JNK levels; however, it down-regulated GSH, GPx, GR, CAT, p-AKT, p-ERK1/2, p-NR1, p-NR2A, p-NR2B, p-GluA1, p-CREB, and BDNF levels. BPA decreased step-through latency (STL) and peripheral and total, but not central, locomotor activity. It increased the time to find the hidden platform, the mean of escape latency time, and the traveled distance in the target quadrant, but decreased the time spent in the target quadrant. The combination of BPA (50 mg/kg) and NmCur (25 and 50 mg/kg) reversed all of BPA's adverse effects.

Conclusion : Conclusion: Therefore, NmCur exhibited neuroprotective effects against subacute BPA-caused learning and memory impairment.

Keywords : Bisphenol A; Neurotoxicity; Cognition; Memory; Curcumin

Count: 22
Abstract ID: 256
subject: Cognition: Learning and Memory
Presentation Type: Poster

Potential neuroprotective effect of vitamin B12, estradiol benzoate, and norepinephrine in improving memory retrieval in an experimental autoimmune disease like multiple sclerosis

Submission Author: Faezeh Ghorbani

Faezeh Ghorbani[1], Mahmoud Gorji-Valokola[2]

1. Department of Anatomy and Cell Biology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Food and Drug Administration, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Background and Aim : Multiple sclerosis (MS) is recognized as an immune-mediated inflammatory condition, that leads to cognitive problems by injuring the hippocampal tissue; however, vitamin B12 (vit B12), estradiol benzoate (EB), and norepinephrine (NEP) has anti-inflammatory and re-myelinating properties. This study aimed to assess the neuroprotective effects of these substances on learning and memory disturbances in an experimental animal model of MS.

Methods : Two stainless steel guide cannulas were bilaterally implanted in 56 adult male rats hippocampal CA1 areas. After recovery, the animals received 3 µl of 0.01% ethidium bromide (EtB) in each of both hippocampal regions, except control group. After three days, the rats were accidentally divided into 8 groups (8 rats/group), including control (completely healthy and/or intact), sham 1 (peanut oil; P), sham 2 (distilled water; D), sham 3 (intra hippocampal normal saline (N) injection (as solvent of NEP)), group 4 (i.p. injection of P with 1 mg/kg EB), group 5 (oral gavage of D with 1 mg/kg vit B12), group 6 (intra hippocampal injection of N with 1 mg/kg NEP), and group of 7 (i.p. injection of P with 1 mg/kg EB + oral gavage of D with 1 mg/kg vit B12 + intra hippocampal injection of N with 1 mg/kg NEP). Behavioral tests (e.g locomotor activity and learning and memory functions) were then estimated by the open-field and shuttle-box tests, respectively. Finally, levels of ROS, MDA, GSH, TNF-α, IL-6, and IL-1β, as well as levels of p-CREB, and BDNF in the left and right CA1 regions, respectively, were evaluated.

Results : The injection of EtB increased ROS, MDA, TNF-?, IL-6, and IL-1? levels, while decreasing GSH content, as well as step-through latency and locomotor activity in sham groups compared to the control group. Conversely, vit B12 (1 mg/kg), EB (50 mg/kg), and NEP (1 mg/kg), especially in combination therapy, markedly counterbalanced all these side effects mentioned above in comparison to the sham groups.

Conclusion : The EtB-induced learning and memory impairment was improved by vit B12, EB, and NEP alone, especially in combination therapy, via the activation and inhibition of different signaling pathways.

Keywords : Multiple sclerosis, Apoptosis, Hippocampus, Memory, Vitamin B12, Estradiol benzoate, Norepinephrine

Count: 23
Abstract ID: 282
subject: Cognition: Learning and Memory
Presentation Type: Poster

Evaluation of the effects of Combination Therapy with Platelet-Rich Plasma and Epidermal Neural Crest Stem Cells on impairment of learning & memory in a rat model of vascular dementia

Submission Author: Somayeh Akbari

Somayeh Akbari[1], Masoud Haghani[2], Mahnaz Bayat[3]

1. Histomorphometry and Stereology Research Center, Shiraz University of Medical sciences, Shiraz, Iran
2. Department of Physiology, the Medical School, Shiraz University of Medical Sciences, Shiraz, Iran
3. Clinical Neurology Research Centre, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : The incidence of dementia is increasing, and despite the exponential increase in the incidence of dementia, effective treatments are still lacking. Combination therapy appears to have a positive effect on vascular dementia as a promising approach. The aim of this study was to evaluate the efficacy of platelet-rich plasma (PRP) and neural crest-derived epidermal stem cells (ESCs), administered alone or in combination, in a two-vessel occlusion (2VO) vascular dementia (VaD) model.

Methods : Sixty rats were divided into six groups: the control, sham, 2VO+vehicle, 2VO+PRP, 2VO+ESC, and 2VO+ESC+PRP. The treated groups received 1 million cells on days 4, 14, and 21 with or without 500 µl PRP (twice a week) after 2VO. The spatial memory evaluated by Morris water maze test.

Results : The results showed impaired learning and memory in 2VO rats. We found that the 2VO+ESC and 2VO+ESC+PRP groups had better memory than the 2VO+V group. Furthermore, in the 2VO + PRP group, PRP injection alone did not improve memory compared to 2VO + V. Specifically, the combined use of PRP and ESC significantly increased the time spent in the target quadrant compared to the PRP group

Conclusion : The combined treatment of ESC and PRP showed better effects than PRP alone. This finding may be an indication for combined therapy of ESC and PRP in VaD.

Keywords : Platelet-Rich Plasma, Epidermal Neural Crest Stem Cells, memory, vascular dementia

Count: 24
Abstract ID: 283
subject: Cognition: Learning and Memory
Presentation Type: Poster

Effects of neural crest-derived epidermal stem cells on hippocampal synaptic plasticity in a rat model of vascular dementia

Submission Author: Somayeh Akbari

Somayeh Akbari[1], Masoud Haghani[2], Mahnaz Bayat[3]

1. Histomorphometry and Stereology Research Center, Shiraz University of Medical sciences, Shiraz, Iran
2. Department of Physiology, the Medical School, Shiraz University of Medical Sciences, Shiraz, Iran
3. Clinical Neurology Research Centre, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Stem cell-based therapy has been promoted as a viable treatment for stroke patients due to its potential for angiogenesis, neurogenesis, and synaptic plasticity. Epidermal neural crest stem cell transplantation is a promising treatment for neurodegenerative diseases. However, there is little data on the damage caused by global cerebral ischemia. This study aimed to evaluate the efficacy of neural crest-derived epidermal stem cells (ESCs) in vascular dementia (VaD) model by two-vessel occlusion (2VO).

Methods : Forty rats were randomly divided into four groups: control, sham-operated, two common carotid artery occlusion rats that received vehicle (2VO+V), and 2VO rats that received vehicle (2VO+V) on postoperative days 4, 14, and 21. 1 × 106 epidermal stem cells (2VO + ESCs) in 300 µl PBS were administered intravenously. Neural crest epidermal stem cells (EPI-NCSCs) were isolated from whisker hair follicles of rats. Basal synaptic transmission, long-term potentiation (LTP), and short-term synaptic plasticity were assessed by field potential recordings in the hippocampal CA1 region.

Results : The results showed that learning, memory, and synaptic plasticity were impaired in 2VO rats. Thirty days after the first transplantation in the 2VO + ESC group, LTP induction was restored without any improvement in basal synaptic transmission. These positive recoveries may be related to the release of various neurotrophic factors from the transplanted cells, which may stimulate endogenous neurogenesis and synaptic plasticity.

Conclusion : Our data showed impaired LTP and BST in 2VO rats compared with the sham group. Transplantation of one million cells could restore LTP and cognitive impairment in 2VO rats.

Keywords : Cerebral ischemia, synaptic plasticity, vascular dementia, Hippocampus

Count: 25
Abstract ID: 324
subject: Cognition: Learning and Memory
Presentation Type: Oral

Memory loss induced by lisdexamfetamine in the rat: A behavioral, electrophysiological, and histopathological Study

Submission Author: Amirreza Beirami

Amirreza Beirami[1], Seyedeh Naghmeh Nourirad[2], Amir-Hossein Bayat[3], Mojtaba Sani[4], Maral Hasanzadeh[5], Abbas Aliaghaei[6], Hojjat-Allah Abbaszadeh[7], Meysam Hassani Moghaddam[8], Susan Roustaee[9]

1. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Hearing Disorders Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Department of Basic Sciences, Saveh University of Medical Sciences, Saveh, Iran
4. Department of Educational Neuroscience, Aras International Campus, University of Tabriz, Tabriz, Iran
5. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
6. Hearing Disorders Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
7. Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
8. Department of Anatomical Sciences, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran
9. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : The study investigates the effects of LDX on the hippocampus of male wildtype strain rats, revealing impairments in short-term and long-term memory, and alterations in microglia, astrocytes, and neurons, suggesting a neuroinflammatory mechanism underlying these effects.The objective of the study was to investigate the impact of LDX exposure on the hippocampus in wild-type rat models on short-term and long-term memory.

Methods : The study used a combination of behavioral tests (Y-maze, Morris Water Maze, and Shuttle box), electrophysiological recordings, and histological analysis to evaluate the effects of LDX on memory and hippocampal function. The study used various methods, including Western blotting, immunohistochemistry, and behavioral tests (Y-maze, shuttle box, and Morris water maze), to assess the effects of LDX on the hippocampus.

Results : The results showed that LDX impaired behavioral performance in all memory assessment tests, increased the fEPSP slope of evoked potentials of LTP components, and altered the expression of caspase-3, microglia, and astrocytes in the hippocampus. The study found that LDX treatment led to impairments in short-term and long-term memory, alterations in microglia, astrocytes, and neurons, and an increase in caspase-3 expression. The results of

the study showed that LDX improved LTP, increased microglia activation, and led to inflammation and cell death.

Conclusion : The study concludes that LDX has destructive effects on the hippocampus, leading to disruptions in memory-related variables, and highlights the need for further research to clarify the underlying mechanisms. The study concludes that LDX has detrimental effects on the hippocampus, leading to impairments in short-term and long-term memory, and alterations in microglia, astrocytes, and neurons, suggesting a neuroinflammatory mechanism underlying these effects. The study concludes that LDX improves LTP, but also leads to microglia activation, inflammation, and cell death.

Keywords : Lisdexamfetamine ; Hippocampus ; Attention deficit hyperactivity disorder ; Glial cells ; Neuroinflammation

Count: 26
Abstract ID: 547
subject: Cognition: Learning and Memory
Presentation Type: Poster

Almonds mitigate cadmium-induced memory impairment: A review of animal models

Submission Author: Zahra Nazari

Zahra Nazari[1], Raheel Bayat[2], Kawsar Alami[3], Sayed Yousof Mousavi[4]

1. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
2. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
3. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
4. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan

Conclusion : Learning and memory are complex processes in the brain that are influenced by various factors. Maintaining neuronal health and synaptic plasticity is essential for proper memory function, but damaging factors such as oxidative stress and toxic substances can disrupt these processes. Cadmium, a toxic heavy metal, is known to cause cognitive decline by disrupting synaptic plasticity and increasing oxidative stress in the brain. On the other hand, bioactive compounds in nuts, such as polyunsaturated fatty acids (PUFAs), antioxidants, and minerals, are shown to alleviate memory disorders. This study aims to investigate the neuroprotective effects of almond consumption on memory impairment, particularly focusing on cadmium-induced neurotoxicity. A comprehensive literature review was conducted, focusing on preclinical animal studies that examined the impact of almond consumption on memory and cognitive functions. The search was conducted across multiple databases (PubMed, Scopus, Web of Science, and Cochrane Library) using keywords related to almonds, memory, cadmium neurotoxicity, and neuroprotection. Only studies involving animal models of cadmium-induced neurotoxicity and those that investigated memory-related outcomes using behavioral and neurochemical assessments were included. The review of selected studies revealed that almond supplementation significantly improved memory and cognitive functions in animal models exposed to cadmium. Behavioral tests, such as the Morris Water Maze (MWM) and Novel Object Recognition (NOR), demonstrated enhanced learning, spatial memory, and cognitive performance. Neurochemical analysis indicated increased levels of acetylcholine, serotonin, and dopamine, along with reduced oxidative stress markers such as malondialdehyde. Almonds were found to modulate neuromodulatory systems, reduce oxidative stress, and improve antioxidant enzyme activity, all of which contributed to the prevention of cadmium-induced memory impairment. The findings suggest that almond consumption can mitigate the adverse effects of cadmium exposure on memory and cognitive function. These results indicate the potential of almonds as a dietary intervention for preventing or alleviating memory disorders related to environmental toxin exposure. Further research is needed to explore the mechanisms of action and optimal dosage for human application.
Keywords : Memory; Neurotoxicity; Cadmium; Almond; Neuromodulator

Count: 27
Abstract ID: 549
subject: Cognition: Learning and Memory
Presentation Type: Poster

Almonds and Scopolamine-induced cognitive disorders: A review of animal studies

Submission Author: Raheel Bayat

Raheel Bayat[1], Zahra Nazari[2], Maliha Sultani[3], Kawsar Alami[4], Sayed Yousof Mousavi[5]

1. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
2. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
3. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
4. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan
5. Department of Cognitive Neuroscience, Neuroscience Research Center, Kavosh Nonprofit Educational Research Institute, Kabul, Afghanistan

Conclusion : Scopolamine, a well-known antagonist of muscarinic acetylcholine receptors, is widely employed in research to induce cognitive and memory impairments in animal models. It disrupts cholinergic signaling, leading to deficits in key cognitive functions such as attention, learning, and memory consolidation. As a result, scopolamine is a reliable model for studying temporary cognitive dysfunctions. Conversely, nuts like almonds are recognized for their beneficial components and positive health effects. This study investigates the effects and underlying mechanisms by which almond consumption may counteract scopolamine-induced cognitive impairments, offering insight into potential therapeutic applications. A comprehensive literature search was conducted using databases such as Web of Science, PubMed, ScienceDirect, Scopus, and the Cochrane Library. The search focused on preclinical studies examining the effects of almond consumption on scopolamine-induced memory impairments in animal models. Studies with controlled experimental designs that used behavioral tests or molecular assays to assess cognitive function were selected for review. The analysis revealed that almond consumption effectively mitigates scopolamine-induced cognitive impairments in animal models. Specifically, almonds improved performance in memory-related behavioral tests. The underlying mechanisms appear to involve multiple pathways, including the inhibition of acetylcholinesterase (AChE) activity, reduction of oxidative stress and lipid peroxidation, and an increase in acetylcholine levels. These findings suggest that almond consumption may provide a neuroprotective effect against cholinergic dysfunctions associated with cognitive impairments. Almond consumption alleviates scopolamine-induced cognitive impairments by enhancing acetylcholine levels in brain regions crucial for memory function. It presents a promising alternative for treating cognitive disorders, such as Alzheimer's disease. Given its potential benefits, future research should explore the use of almonds in combination with other natural interventions to develop a comprehensive

therapeutic strategy aimed at enhancing cognitive resilience and improving overall brain health.

Keywords : Almond; Scopolamine; cognition; memory; AChE

Count: 28
Abstract ID: 473
subject: Cognition: Learning and Memory
Presentation Type: Poster

Memory loss induced by lisdexamfetamine in the rat: A behavioral, electrophysiological, and histopathological Study

Submission Author: Amirreza Aghababaie

Amirreza Aghababaie[1], Abbas Aliaghaei[2]

1. Student of 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 : Lisdexamfetamine (LDX) is one of the drugs commonly used to treat attention deficit hyperactivity disorder (ADHD). However, its neurological side effects, particularly on cognition, are not fully understood.

Methods : The present study focused on memory in rats treated with four weeks of LDX injection. We compared LDX-treated rats with control ones, using several methods to evaluate the behavioral responses and electrophysiological, molecular, and histological properties in the hippocampus.

Results : Our findings demonstrated that subchronic administration of LDX impaired behavioral performance in all memory assessment tests (Y maze, Morris Water Maze, and Shuttle box). Although LDX did not alter population spike (PS) amplitude, it increased the field excitatory postsynaptic potential (fEPSP) slope of evoked potentials of LTP components. Also, in addition to an increase in expression of caspase-3 in the hippocampus, which indicates the susceptibility to apoptosis in LDX-treated rats, the number of microglia and astrocytes went up significantly in the LDX group. Moreover, Sholl's analysis showed an increase in the soma size and total process length in both hippocampal astrocytes and microglia.

Conclusion : Overall, because of these destructive effects of LDX on the hippocampus, which is one of the critical memory-related areas of the brain, the findings of this investigation provide evidence to show the disruption of memory-related variables following the LDX. However, more research is needed to clarify it.

Keywords : Lisdexamfetamine; Hippocampus; Attention deficit hyperactivity disorder; Glial cells; Neuroinflammation

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

Uncovering Task Complexity in Visual Working Memory: A Thorough Examination of Factors Impacting Performance

Submission Author: Fatemeh Mortazavi

Fatemeh Mortazavi[1], Hadi moradi[2], Abdol-hossein Vahabie[3], Majid Nili Ahmadabadi[4]

1. School of Electrical and Computer Engineering, University of Tehran, North Kargar St., Tehran, Iran
2. School of Electrical and Computer Engineering, University of Tehran, North Kargar St., 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
4. School of Electrical and Computer Engineering, University of Tehran, North Kargar St., Tehran, Iran

Background and Aim : Spatial working memory (SWM) is a critical cognitive function that enables individuals to retain and manipulate visual information over short periods. Traditional research on SWM performance has predominantly focused on the number of items held in memory, yet this approach may oversimplify the underlying cognitive processes. Recent studies suggest that both the quantity and spatial arrangement of stimuli can significantly impact task difficulty and recall accuracy. This paper aims to explore the factors influencing performance in a visual SWM task, moving beyond item count to incorporate spatial relationships, distance from the display center, and selection strategies. By examining these multifaceted determinants, we seek to provide a more comprehensive understanding of task complexity with implications for adaptive cognitive training.

Methods : We employed a computer-based visual pattern memory paradigm with 20 participants (age range 18-30). The task required participants to recall the positions of target stimuli (yellow hexagons) interspersed with non-target stimuli (white hexagons) on a hexagonal grid. Two variables were manipulated: the quantity of target stimuli and their spatial distribution (dense vs. distributed patterns). Eye movements were controlled to ensure visual scanning strategies did not confound performance. Generalized linear models were used to analyze performance, with independent variables including the number of target and non-target stimuli, spatial relationships between stimuli, distance from the center of the display, and participant selection strategies.

Results : The analysis revealed that performance was significantly affected by both the number and spatial arrangement of target and non-target stimuli. Dense stimulus patterns led to better recall accuracy compared to distributed patterns, suggesting the effectiveness of chunking strategies in enhancing memory performance. Additionally, participants demonstrated a bias toward selecting stimuli on the left side of the display, and the spatial distribution of the targets modulated this bias. The distance of stimuli from the display center also played a role in recall accuracy, with stimuli closer to the center being more frequently and accurately recalled. These

findings indicate that stimuli's quantity and spatial organization shape task difficulty in spatial working memory tasks.

Conclusion : This study highlights the importance of considering both quantitative and qualitative aspects of visual stimuli when assessing task difficulty in spatial working memory. Our findings demonstrate that dense stimulus patterns improve recall performance, likely due to chunking strategies, while a left-side selection bias further complicates task dynamics. These results underscore the need for a more nuanced approach to scaling difficulty in SWM tasks, which could have significant implications for designing adaptive cognitive training programs. By integrating spatial relationships and biases into performance metrics, researchers and educators can develop more sophisticated training tools that are better suited to individuals' cognitive processing abilities.

Keywords : spatial working memory, visual memory, task difficulty, cognitive training, chunking strategy, stimulus distribution, memory performance

Count: 30
Abstract ID: 156
subject: Cognition: Working Memory
Presentation Type: Oral

The interplay between cognitive performance and electroencephalographic features in air traffic controllers: a real-world study

Submission Author: Marzieh Izadilaybidi

Marzieh Izadilaybidi[1], Mohammad Ali Nazari[2], Yahya Rasoulzadeh[3], Iman Dianat[4], Mehdi Samavati[5], Mohammad Asghari Jafarabadi[6]

1. Department of Ergonomics, School of Public Health, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran.
3. Department of Occupational Health and Ergonomics, Faculty of Health, Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Occupational Health and Ergonomics, Faculty of Health, Tabriz University of Medical Sciences, Tabriz, Iran
5. Research Center for Biomedical technologies & Robotics, Tehran University of Medical Sciences, Tehran, Iran.
6. Cabrini Research, Cabrini Health, Malvern, VIC, 3144, Australia.

Background and Aim : Introduction: Air traffic control is considered as one of the stressful jobs. In anxiogenic and stressful world, the maintenance of an optimal cognitive performance is a constant challenge. It is particularly true in complex working environments e.g. air traffic control , where individuals have sometimes to cope with a high mental workload and stressful or unexpected situations. By monitoring the occurrence of such states, serious consequences of performance breakdown can be prevented. The psychophysiological measures reflect the information regarding various human performance status. If this scientific assessment tools and methods are used in field research, their findings may be more valuable than research conducted in a laboratory. Thus,this study explored the relationship among cognitive performance and electroencephalographic features of air traffic controllers in real-world study.

Methods : A cross-sectional comparative study was conducted on 20 professional air traffic controllers. EEG signals recorded while controllers performed cognitive tasks [A-X Continuous Performance Test (AX-CPT) and 3-back working memory task] after they were exposed to two levels of task difficulty (high and low mental workload) in the morning and afternoon. mental workload was assessed in these two levels of task difficulty by NASA-TLX questionnaire. EEG data were first recorded and stored using the software BioTrace + software®, Mind Media BV, Roermond-Herten, The Netherlands and further exported in MAT file format to Matlab R2017a for the next offline processing. Statistical analysis of the data was performed using SPSS software version 23.0, including descriptive statistics and mixed model analysis of variance (ANOVA) for evaluation of relationships between the cognitive performance of air traffic controllers and the characteristics of EEG signals. In this model, the

interaction effect of task difficulty levels and time of day on the relationship between cognitive performance and EEG signals was considered.

Results : In the frontal region, the relationship between the commission errors with alpha in the sustained attention task depends on the interaction between task difficulty levels and time of day (P = 0.017). In the parietal region, the relationship between the commission errors with delta in the sustained attention task depends on the interaction between task difficulty levels and time of day (P = 0.001). In the parietal region, the relationship between correct responses with alpha in the working memory task depends on the interaction between task difficulty levels and time of day (P = 0.038). In the parietal region, the relationship between correct responses with beta in the working memory task depends on the interaction between task difficulty levels and time of day (P = 0.032).

Conclusion : The findings highlight the important role of EEG activity in response to task difficulty levels during the day. The findings provide guidance for application of changes in psychophysiological measures when mental workload level is manipulated during the day that could be implemented in future for the development of real-time monitoring systems to improve aviation safety.

Keywords : Cognitive performance, Mental workload, Time of day, Working memory, sustained attention, Air traffic control

Count: 31
Abstract ID: 249
subject: Cognition: Working Memory
Presentation Type: Oral

Language and Cognitive Performance: Stroop Task Analysis in Persian-English Bilinguals

Submission Author: Mahta Mahboubi

Mahta Mahboubi [1], Borhan Beigzadeh [2]

1. Iran University of Science and Technology, IUST
2. Iran University of Science and Technology, IUST

Background and Aim : The Stroop effect, identified by John Ridley Stroop in 1935, is a key tool for studying cognitive processes, particularly in bilingual individuals. Research shows that bilinguals exhibit greater brain activity in the prefrontal cortex during Stroop tasks. Studies have revealed that response times are slower in a second language, influenced by cultural and linguistic backgrounds. Recent research using EEG techniques has demonstrated distinct brain activity patterns in response to red, green, and blue stimuli. This study focuses on Persian-English bilinguals in Stroop tasks, exploring cognitive load differences and providing precise findings for color-specific cognitive performance, while maintaining a focus on data accuracy.

Methods : This study examined eight participants, consisting of four females and four males aged 20 to 26, all native Persian speakers proficient in English. Experiments were conducted in a soundproof and light-insulated environment using a calibrated 17-inch display. Utilizing the classic Stroop effect, the study employed MATLAB and Psychtoolbox, focusing on four colors: blue, red, green, and yellow. Color words were presented in either congruent or incongruent formats, displayed sequentially with progressively decreasing durations of 1, 0.8, and 0.5 seconds. Participants provided responses via a keyboard, addressing both the color and conceptual meaning of the words. Data were analyzed using ANOVA to assess variance between groups effectively.

Results : This study explores the differences between Persian and English in color perception and word meaning. Participants demonstrated notable differences in their responses to colors, especially blue and red, with faster reaction times in English. This suggests that language influences cognitive processing of colors, leading to quicker decision-making for certain hues. In terms of word meanings, participants experienced longer response times in English, influenced by the complexity of specific words like "blue." Overall, the findings indicate that Persian concepts generally evoke quicker responses, while English poses unique challenges, highlighting the interplay between language and cognitive efficiency.

Conclusion : This study examined how bilingualism affects Stroop task performance in Persian and English. Results revealed significant differences in cognitive load and performance between the two languages. Overall, participants responded fastest to color questions for blue in both languages, with English showing fewer errors and shorter response times in reading

color words. Interestingly, the color green behaved differently, displaying quicker reactions and fewer errors in Persian. Additionally, the analysis indicated that distinguishing between color and meaning for blue in Persian resulted in a notable increase in response time, highlighting the complexities of cognitive processing in bilingual individuals.

Keywords : cognitive load, bilingualism, response time, Task designing, Stroop tasks.

Count: 32
Abstract ID: 28
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Executive functions in children with sensory neural hearing loss (SNHL)

Submission Author: Nazanin Hajjari

Nazanin Hajjari[1], Maryam Ramezani[2]

1. Department of Audiology, Faculty of Rehabilitation Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Rehabilitation research center, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran.

Conclusion : Executive functions (EFs) are related to a variety of cognitive skills primarily regulated by the prefrontal cortex, including inhibition, working memory, cognitive flexibility, emotional self-regulation, and attention. These functions begin to emerge in the first year of life and progressively develop throughout adolescence into early adulthood, paralleling the maturation of the neurological functions of the prefrontal cortex. Children with sensory neural hearing loss (SNHL) often experience delays in language acquisition, executive function, and visual cognitive deficits for different reasons, including late diagnosis or intervention, inadequate follow-up, inconsistent auditory-verbal therapy, and nonuse of hearing aids. The ongoing language delays and cognitive impairments observed after intervention may be linked to changes in brain structure and function in these individuals. Studies has shown that children with hearing impairments perform worse in areas such as working memory, inhibition, cognitive flexibility, and attention when compared to their normally hearing counterparts. Hearing deprivation during childhood can affect cognitive abilities beyond just language skills, and children with SNHL often struggle with tasks that require executive functioning. Despite the effectiveness of interventions like hearing aids or cochlear implants, up to 50% of children with hearing challenges exhibit behavioral issues, which can negatively impact their language and social development. Electroencephalographic studies in children with hearing impairments have indicated differences in the neural organization of the bilateral frontal cortex (related to executive functions) and the left temporal-frontal region (associated with expressive language). It has been reported that even with prolonged use of cochlear implants, children with SNHL typically exhibit lower performance in executive functions—especially in working memory, verbal fluency, inhibition, and attention—compared to their peers with normal hearing. Consequently, EFs play a vital role in learning processes and modifying behavior patterns, which are essential for preschool children as they develop new executive skills. Therefore, it is crucial to implement targeted exercises focused on specific deficits as part of a rehabilitation program for children with hearing loss at an early age. Understanding the consequences of EF deficits in preschoolers is key to achieving accurate diagnoses and developing appropriate rehabilitation strategies.

Keywords : Executive functions; children; sensory neural hearing loss; language

Count: 33
Abstract ID: 70
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The effects of ischemic stroke on neurocognitive pathology behavior in the medial prefrontal cortex in animal model

Submission Author: Behnaz Mirza ahmadi

Behnaz Mirza ahmadi[1], Reza Rahbarghazi[2], Mohammad Karimipour[3]

1. Department of Applied Cell Sciences, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Applied Cell Sciences, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Anatomical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Stroke is one of the most common causes of death and disability in societies. Evidence showed that post-stroke depression (PSD) and post-stroke anxiety (PSA) affect approximately 30% and 25% of stroke survivors respectively, which happens when the medial prefrontal cortex (mPFC) is damaged. Current antidepressant treatments lead to remission in only 30% of patients, so preclinical models are needed to develop treatments for PSD and PSA. This project presents the photothrombotic focal ischemic stroke model in the mPFC and examines its effect on the mouse model by histological and behavioral tests.

Methods : Mice were anesthetized with ketamine and xylazine, and scrubbed with an antiseptic solution. Then an incision was made, 500 microliters of the rose Bengal solution were injected and, the green laser was irradiated to the mPFC under constant control of body temperature. After 3 days histological and behavioral tests including the force swim test, open field, and elevated plus maze were performed. For the force swim test mice were placed into a transparent cylinder where the water height was 30 cm. In the open field test mice were placed into a box surrounded by 30 cm high sidewalls and behavior and anxiety were assessed via analysis of the time spent in each zone. The elevated plus maze apparatus was 50 cm above the floor and consisted of two open arms crossed at a central platform with two opposed arms of the same size enclosed by walls (40 cm high). Each mouse was placed on the central platform of the apparatus facing an open arm and was allowed to explore the maze. 2,3,5-triphenyltetrazolium chloride staining (TTC; 2%) and H&E experiment were performed to evaluate cellular and histological analyses.

Results : Brains were removed and cut into slices of 2 mm diameter. H&E staining revealed that the photothrombotic stroke model in the mPFC of mice induced a significant ischemic injury, with prominent cell death. TTC assay determined the metabolic activity in the intact area with consideration of general appearance and morphological characteristics. This experiment showed a clear delineation between the infarcted (white) and non-infarcted (red) brain tissue, confirming the successful induction of a focal ischemic stroke in the mPFC. Behavioral test results indicated that mice subjected to the photothrombotic stroke model exhibited remarkable signs of anxiety and depression-like behavior compared to the control

group. In the forced swim test, the stroke-induced mice showed an increase in immobility time, which is considered an indicator of depression-like behavior. Similarly, in the open field test, these mice spent significantly less time in the center zone, indicating heightened anxiety-like behavior. In the elevated plus maze test, stroke-induced mice showed reduced exploration of the open arms, further supporting the presence of anxiety-like behavior.

Conclusion : We successfully established an animal model that showed depression and anxiety-like behavior that can used for further investigation on ischemic stroke in mPFC.

Keywords : ischemic stroke, mPFC, depression, anxiety

Count: 34
Abstract ID: 587
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

The Effects of Social Status on Effort-based Decision-Making in Male Rats

Submission Author: Ghazale Roshani

Ghazale Roshani[1], Soomaayeh Heysieattalab[2], Farhad Farkhondeh Tale Navi[3]

1. department of cognitive neuroscience, university of Tabriz
2. department of cognitive neuroscience, university of Tabriz
3. department of cognitive neuroscience, university of Tabriz

Background and Aim : From the early years of life, we observe the social world around us and strive to maintain or elevate our position within the social hierarchy. This hierarchy exists not only among humans but also in many species, aiding in increased cooperation and reduced conflict over resources and mates. Access to resources and mates, which are considered desirable rewards that require effort and competition, depends on an individual's rank in the hierarchy. Dominant individuals in a social hierarchy typically have better access to resources and may exhibit different effort based decision-making behaviors.

Methods : In this study, we examined differences in effort-based decision-making among dominant, subordinate, and intermediate rats (n=7) by recording local field potentials during a cognitive task. Male, same-sex, and same-strain (Wistar) rats were used, which were housed in groups of three after weaning. This research included two stages of behavioral testing. The first stage of the behavioral experiment was the implementation of the tube test to determine their relative social status. Rats entered the tube two by two, each from one side, and fought with each other, and finally, by averaging the number of wins, the dominant, subordinate, and intermediate rats of each specific cage were determined. The second stage of the behavioral experiment was decision-making performance which was assessed using a T-maze that included two arms: one arm contained higher reward and a 30 cm barrier making it effortful to access the reward, and the other arm contained lower reward but there was no barrier which made it easier to reach the reward.

Results : The hypothesis was that the percentage of choices and the time taken to reach the end of the arms with low and high rewards would differ among rats with varying social ranks. Results indicated a significant behavioral difference in the percentage of arm choices with dominant rats choosing the high reward arm more than 80%, intermediate rats 60.29% and subordinate rats only 7.5%. But the time taken to reach the end of the arms with low and high rewards was not significantly different between the three groups.

Conclusion : This study provides evidence that social hierarchy may influence effort-based decision-making in rats, aligning with previous research on the relationship between dominance and reward-seeking behavior. The results indicate that dominant rats are more

willing to exert effort for higher rewards, suggesting a greater motivation or confidence in their ability to achieve desired outcomes. In contrast, subordinate rats preferred the low-effort option, which may reflect a risk-averse strategy or a lack of confidence in their capacity to secure high rewards.

Keywords : Social hierarchy; Effort-based decision-making; Behavioral study

Count: 35
Abstract ID: 363
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Unraveling the Lateral Habenula's Role in Value-Based Decision-making

Submission Author: Zahra Mahmoudi Azari

Zahra Mahmoudi Azari[1], Soomaayeh Heysieattalab[2], Farhad Farkhondeh Tale Navi[3], Leila Mehdizadeh Fanid[4]

1. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
2. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
3. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
4. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran

Background and Aim : The habenula is a complex anatomical region located in the epithalamus and consists of the central nucleus (MHB) and lateral nucleus (LHB). In particular, LHB has attracted much research attention due to its participation in the processing of reward-seeking behavioral states, cognitive flexibility, motivation and emotions, and decision-making. Previous studies have supported an important role for LHB in dynamic decision-making, including associated decisions with discounting costly high value rewards. Studies have suggested that the LHB might have an integrated effect on effort-based decision-making, even if choice contingencies remain unchanged. The purpose of this study was to investigate the electrical activity of the LHB during value-based decision-making. We performed LFP electrophysiological recordings in the LHB to investigate the neural correlates associated with this decision-making process.

Methods : In the present study, we used 11 Wistar male rats. . Rats were trained to perform T-maze decision-making tasks with a differential reward (High vs. Low) and cost (delayed vs. immediate) and simultaneously recorded local field potentials (LFP) from the LHB. .

Results : Our results revealed a significant increase in the 4Hz power (3-5 Hz) of LHBof LHB when rats decide the high value and delayed reward, in contrast to their choice of the low value and immediate reward.

Conclusion : The increased of 4HZ (3-5) activity within the LHB during value -based decision-making task could suggest that this region plays a crucial role in encoding motivational and emotional states associated with reward evaluation. 4 Hz rhythms have been linked to cognitive processes such as attention, memory retrieval, and learning. The observed 4Hz activity might reflect enhanced neural coordination necessary for integrating various cognitive inputs while weighing options—particularly when assessing high value rewards against low value immediate ones. The understanding of these processes has the potential to provide insight into neuropsychiatric disorders characterized by impulsivity and reward sensitivity, which may provide therapeutic interventions for these conditions.

Keywords : value-based decision making; lateral habenula; local field potential

Count: 36
Abstract ID: 340
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

Bias in Belief: How Confirmation bias Shapes Our Views on Science, Culture, and the Supernatural

Submission Author: Marjan Anooshiravani

Marjan Anooshiravani [1], Atiye Sarabi Jamab[2]

1. Cognitive Psychology MSc Student, Institute for Cognitive Science, Tehran, Iran
2. Faculty of Governance, University of Tehran, Tehran, Iran

Background and Aim : Confirmation bias is the cognitive tendency to favor information that aligns with one's prior beliefs (Nickerson, n.d.). This bias significantly contributes to social polarization (Lefebvre et al., 2023). Although confirmation bias has been widely studied, its comparative influence on altering prior beliefs across different categories remains underexplored. This study investigates various belief categories, including scientific, cultural, and supernatural beliefs, To understand whether there is a significant difference in the susceptibility of different categories of beliefs toward confirmation bias. Additionally, we analyzed participants' web search behavior to evaluate the differences between those with confirmed beliefs and those without.

Methods : In this study, we assessed participants' beliefs across three categories: scientific (e.g., GM food health), cultural (e.g., the evil eye), and supernatural (e.g., UFOs). A pre-test was administered to evaluate participants' initial beliefs using a visual analog scale, with scores ranging from -50 to +50 for each category. Following this, participants were exposed to a neutral environment presented in text format information, where they received fifteen pieces of supporting evidence and fifteen pieces of contradicting evidence. The only manipulation involved presenting the information in an order where 30% of the initial text supported participants' prior beliefs. After this exposure, participants were instructed to conduct an online search in a simulated environment using a fixed search query related to the same topics, without any time constraints, to broaden their perspectives. Their online search behavior was tracked, including the time spent and the number and type of pages viewed, categorized as either opposing or confirming their initial beliefs, to determine how they interacted with information that either supported or challenged their initial beliefs. Subsequently, their post-intervention beliefs were re-evaluated.

Results : The analysis revealed that confirmation bias was present across all belief categories, though its strength varied. To measure belief conformity, we created a belief confirmation index, categorizing individuals as "confirmed" if their belief change (b2 - b1) exceeded 10 points in favor of their initial belief. A Shapiro-Wilk normality test showed that belief changes between the supernatural and scientific categories were not normally distributed ($p < 0.05$). A Wilcoxon rank-sum test indicated a significant difference between scientific and supernatural belief confirmation ($p = 0.05$), demonstrating a significant difference in belief change.

Additionally, regarding the total number of websites visited, a Shapiro-Wilk test confirmed that the distribution of visits was not normal across the two topics ($p < 0.05$). A subsequent Kruskal-Wallis test revealed no significant differences between the groups (Kruskal-Wallis statistic = 0.73, $p = 0.69$).

Conclusion : The findings reveal that supernatural beliefs exhibited a stronger confirmation bias compared to scientific beliefs, despite participants engaging in similar web search behaviors. Supporting evidence had a more significant influence on supernatural beliefs, while scientific beliefs demonstrated a more balanced response, with participants being slightly more open to integrating opposing information. This study underscores the necessity for tailored approaches to presenting information to mitigate bias. Addressing confirmation bias is essential for fostering critical thinking and encouraging a more open-minded exploration of diverse viewpoints, especially in today's increasingly polarized society.

Keywords : Confirmation Bias; Belief Change; Context-Dependent Beliefs; Supernatural Beliefs; Scientific Beliefs

Count: 37
Abstract ID: 630
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

Social Setting Improves Informed Reversal Learning

Submission Author: Armin Taherifard

Armin Taherifard[1], Nafiseh Moghanizadeh Bafghi[2], Sabereh Faez[3], Abdol-Hossein Vahabie[4], MN Ahmadabadi[5]

1. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
2. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
3. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
4. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
5. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran

Background and Aim : Despite the inherent complexity of social learning, individuals often navigate social environments with notable efficiency. This observation raises an important question: How does social information influence the mechanism of human reinforcement learning? A key focus of our research is determining when and under what conditions people use social information for their learning process. In this research, we explore whether the awareness of future social tasks and long-term goals serves as a motivating factor for relying more heavily on social information and does it improves their learning outcomes. In addition to understanding the effect of future awareness, another critical question is determining whether social information affects utility or policy during the learning process. Our research explores the multifaceted role of social learning in reinforcement learning, addressing not only how social information impacts policy and value functions, but also how motivational factors and complex environments influence the integration and effectiveness of social cues in human learning.

Methods : To address the research questions, we designed an experiment called the “Reversal Social Task,” consisting of three blocks. We collected data in three different groups. The first group, the non-social group, completed the whole experiment individually. We use this group as a baseline for comparison. In the second group, participants were informed of the instruction of all three blocks at the start of the task. The third group, however, received instruction on each block at the beginning of that specific block. The foundation of the task is a 4-armed bandit problem. In the first block, participants perform the task individually, without any interaction with others. In the second block, participants play alongside three counterparts but only observe the decisions of their counterparts once every three trials. In the third block, participants choose one counterpart to observe once every three trials, with the option to choose

no counterpart at all. At the beginning of each block, we shuffle the cards to randomize the task.

Results : Comparing the individual and social groups, the social group demonstrates faster learning and better ability to distinguish between the best and second-best cards. Social information aids participants in reaching the global optimum, while the individual group tends to stay at a local optimum. Additionally, participants who are aware of future tasks invest more cognitive resources in analyzing their counterparts, leading to better performance in the second and third blocks.

Conclusion : Social information accelerates learning and helps participants achieve optimal solutions in complex tasks. Different social settings such as awareness of future tasks enhance motivation, prompting greater cognitive effort and improving overall performance.

Keywords : Social Learning; Reinforcement Learning; Social Settings; Complex Tasks; Local Optima; Global Optima

Count: 38
Abstract ID: 536
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Investigating the effects of low dose of Morphine on modulation of inhibition ability in non-human primate.

Submission Author: Elahe Rohani

Elahe Rohani[1], Vahid Sheibani[2], Farshad Alizadeh Mansouri[3], Sadegh Ghasemian[4], Fatameh Mohtashami Borzadaran[5]

1. PhD candidate at Kerman Neuroscience Research Center
2. Head of Kerman Neuroscience Research Center
3. Director of Cognitive Neuroscience Laboratory, Biomedicine Discovery Institute. Associate Professor, Department of Physiology. Faculty of Medicine, Nursing and Health Sciences. Monash University, Australia. Visiting Scientist, RIKEN Centre for Brain Science, Wako, Japan.
4. Assistant professor at Kerman Neuroscience Research Center
5. PhD candidate at Kerman Neuroscience Research Center

Background and Aim : Acute pain is frequently encountered in the emergency department (ED), affecting over fifty percent of patient visits. Consequently, managing pain is a critical yet complex aspect of emergency medicine. There is an ongoing effort to identify an optimal medication that delivers rapid pain relief while minimizing adverse effects. Opioids are recognized as effective analgesics and are routinely utilized in the ED for the management of acute pain. Morphine is widely used to control moderate-to-severe postoperative pain and the use of small i.v. boluses of morphine in the post-anesthesia care unit allows a rapid titration of the dose needed for adequate pain relief. Emergency medicine textbooks commonly recommend that the initial analgesic dose of IV morphine should be 0.1 mg/kg. Morphine and other opioid analgesics may interfere with normal cognition, particularly inhibition ability, and motor function when the drugs are used for long-term treatment of pain. However, it is unclear whether such deficits develop with short-term treatment and the minimal dose of opioids.

Methods : This study aimed at examining the effects of low doses of Morphine on inhibition ability and response execution of macaque monkeys. In a crossover design, monkeys received Morphine (0.1 mg/kg) or saline before performing a stop-signal task in which they must respond rapidly to a visual go-cue in Go trials but inhibit the initiated response following the onset of a stop-cue in Stop trials. In front of a touch-sensitive screen that displayed the stimuli, the monkey set unrestrained in a wheeled transport cage. The animals could touch the screen and pressed a switch (located below the touchscreen) by reaching between the cage's bars. The display of stimuli, monitoring of animal responses, and delivery of the reward (juice) for correct responses were all carried out by means of an automated system that was programmed in Matlab. During cognitive task performance, the monkeys' behavior was monitored by a video camera.

Results : Compared to the baseline level, the Reaction Time (RT) in Stop trials (SSRT) and Go trials was not changed significantly. Performance in Go trials reflects the monkeys'

response execution. There was not any significant changes in the percentage of correct responses in Go trials.

Conclusion : Our findings indicate that short term exposures to low dose of morphine, which is akin to its clinical use, has no effect on cognitive performance, especially inhibitory ability in macaque monkeys.

Keywords : inhibition ability, morphine exposure, macaque monkey

Count: 39
Abstract ID: 571
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Investigating the effectiveness of social-cognitive mindfulness on self-efficacy, executive functions and problem-solving

Submission Author: Leila Najaei Abadi

Leila Najaei Abadi[1], Leyla Rastgar Farajzadeh[2]

1. Comprehensive Center for Assessment, Education, Rehabilitation and Timely Developmental Interventions, Exceptional Education Organization, Tabriz, Iran.
2. Department of Neurosciences and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Iran

Background and Aim : This study aimed to explore the impact of social-cognitive mindfulness, which focuses on straightforward, short-term cognitive strategies, on students' academic self-efficacy, executive functions, and problem-solving skills.

Methods : This research is a semi-experimental study utilizing a pre-test and post-test design. The study population was high school students aged 14-18 in Tabriz city. A sample of 30 students was selected, with 15 participants in the intervention group focused on social-cognitive mindfulness and 15 in the control group. The Academic Self-Efficacy Beliefs Questionnaire (ASEBQ; Zajacova, Lynch & Espenshade, 2005), Wisconsin Card Sorting Test (WCST; Miles et al., 2001) and Problem-Solving Inventory (PSI; Happner & Petersen, 1982) were employed in the study for data collection.

Results : The results demonstrated that social-cognitive mindfulness significantly enhances students' academic self-efficacy, executive functions, and problem-solving skills ($P<0.001$).

Conclusion : Social-cognitive mindfulness enhances students' executive functions and problem-solving skills by promoting greater awareness, flexibility, engagement, decision-making, and creativity, thereby boosting their academic self-efficacy.

Keywords : Social-cognitive mindfulness, Self-efficacy, Executive functions, Problem-solving

Count: 40
Abstract ID: 631
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

Social Human-AI Interaction in Reinforcement Learning

Submission Author: Nafiseh MoghanizadehBafghi

Nafiseh MoghanizadehBafghi[1], Armin Taherifard[2], Sabereh Faez[3], Abdol-Hossein Vahabie[4], MN Ahmadabadi[5]

1. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
2. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
3. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
4. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
5. School of Electrical & Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran

Background and Aim : In recent years, with the advancement of artificial intelligence (AI) technologies and their increasing presence in everyday life, examining the impact of these technologies on human social learning processes has become an important topic. This research investigates the differences in human social learning when facing AI compared to interacting with fellow humans. The primary objective of this study is to analyze how human evaluations of AI behaviors influence their learning processes, as well as to explore the differences in learning from these two groups.

Methods : This study investigates the differences in human social learning when interacting with artificial intelligence (AI) versus human counterparts. We designed a 4-armed bandit experiment where all task components, procedures, and interactions were identical across two groups: an "AI group" and a "Human group." The only distinction between the groups was how participants were instructed to perceive their counterparts' actions. • AI Group: Participants were told that they were observing the choices made by AI agents. • Human Group: Participants were informed that they were observing decisions made by other human participants. The experiment was divided into three blocks, and the structure remained the same across both groups: • Block 1 (Individual Learning): Participants performed the task independently without any interaction with or observation of others. • Block 2 (Intermittent Observation): Participants observed the decisions of three counterparts once every three trials while making their own decisions. The only variation between the two groups was the perception of who the counterparts were—AI agents or humans. • Block 3 (Selective Observation): Participants were given the option to select one counterpart to observe once every three trials, or to proceed without observing any counterpart. At the start of each block, the available options (arms) in the 4-armed bandit task were randomized by shuffling cards to introduce variation across trials.

Results : In the AI group, participants showed a strong tendency to trust and imitate AI agents, even when the agents made incorrect decisions. This over-reliance on AI led to more frequent errors and, by the end of the third block, a decline in performance. After following incorrect choices from the AI agents, participants experienced confusion and began exploring alternatives, reducing their overall performance.

Conclusion : Participants tend to trust AI agents more than humans or even themselves, which leads to unconditional imitation. However, when AI agents make mistakes, this trust is quickly broken, causing participants to enter an exploration phase and reducing their performance. This trust issue with AI is critical to explore, especially with the growing importance of human-AI interactions.

Keywords : Social Learning; Artificial Intelligence; Reinforcement Learning; Human-machine Interaction; Trust

Count: 41
Abstract ID: 720
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

Mastering the Magic Wand of Cognitive Techniques for Enhancing Adolescents' Divergent Thinking: Perceptions, Processes, and Products

Submission Author: Forough Kasiri

Forough Kasiri[1], Naser Behroozi[2], Alireza Haji Yakhchali[3]

1. Shahid Chamran University
2. Shahid Chamran University
3. Shahid Chamran University

Background and Aim : Divergent thinking is a cognitive process that involves generating a wide array of diverse solutions to a given problem. As a strategic approach to problem-solving, it promotes flexibility and adaptability—qualities that are essential for creative performance and effective decision-making. Fostering the development of divergent thinking in adolescents is vital, as it enhances their capacity for self-expression and equips them to tackle challenges, which are critical for their future success in education and careers within an ever-evolving landscape. Considering the importance of developing divergent thinking, this study explored the effects of training in four divergent thinking techniques—brainstorming, random connection, schema violation, and SCAMPER—on the triad of divergent perceptions, thinking processes, and products among adolescents.

Methods : A total of fifty-four females, aged 15 to 17, voluntarily participated in this quasi-experimental study. To evaluate divergent perception, processes, and products, we utilized computerized versions of Pepin's Pareidolia Test, Guilford's Alternative Uses Test (AUT), and Görlich's Creative Process Assessment Scale (CPAS) in both pre-test and post-test formats. The Pareidolia Test consisted of 30 cloud-like fractal images (15 for the pre-test and 15 for the post-test) with varying contrast levels, measuring reaction time, the occurrence of pareidolia (indicative of flexibility), and the number of perceived objects (reflecting fluency). The AUT required participants to generate as many potential uses for common objects (pre-test: brick; post-test: newspaper), with assessments based on fluency, flexibility, novelty, and elaboration of the ideas produced. The CPAS evaluated eight distinct processes: 1) problem discovery, 2) information search, intake and valuation, 3) concept combination, 4) idea generation, 5) development of a solution approach, 6) idea evaluation, 7) adaptation and realization, and 8) communication and implementation. Prior to the instruction of the techniques, pre-tests for the aforementioned triad were administered, and participants were randomly assigned to either experimental or control groups. The divergent thinking techniques were taught over eight one-hour sessions (two sessions dedicated to each technique), while the control group received no specific intervention. Post-tests were conducted for both groups following the final session.

Results : The results of running MANCOVAs and subsequent ANCOVAs demonstrated that training in cognitive techniques significantly enhanced the divergent products, thinking processes, and perceptions of adolescents in the experimental group. Notably, the intervention led to substantial improvements across all subscales of divergent products, five subscales of divergent thinking processes (including problem discovery, concept combination, idea generation, development of a solution approach, and idea evaluation), and two subscales of divergent perception (specifically, the occurrence of pareidolia and the number of perceived objects) when compared to the control group.

Conclusion : The findings suggest that training in cognitive techniques can effectively enhance the three components of divergent thinking. The implications of this study will be discussed in detail.

Keywords : Divergent thinking; Cognitive techniques; Perception, Product, Processes

Count: 42
Abstract ID: 716
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Poster

Exploring Executive Function Disorders in Children: Cognitive Impairments, Developmental Pathways, and Intervention Strategies

Submission Author: Khatereh Majlesain

Khatereh Majlesain[1]

1. MS degree in clinical psychology, Department of Psychology, Faculty of Psychology, Najafabad Branch, Islamic Azad University, Isfahan, Iran

Conclusion : Abstract: Executive function (EF) disorders in children encompass a range of cognitive impairments that impact a child's ability to plan, control impulses, focus attention, and regulate emotions. These disorders are integral to understanding neurodevelopmental challenges that affect social, emotional, and academic outcomes. This review synthesizes findings from recent research on the development of EF disorders in children, examining the cognitive deficits linked to conditions such as attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and specific learning disabilities. The article begins by outlining the core components of executive functions—working memory, cognitive flexibility, inhibitory control, and self-regulation—and how impairments in these areas can affect a child's adaptive functioning. For instance, deficits in inhibitory control and working memory are prevalent in ADHD, manifesting as difficulties in impulse control, sustained attention, and task completion. Similarly, children with ASD may experience challenges in cognitive flexibility and planning, which contribute to struggles with adapting to new environments or routines. Learning disorders often impact executive processes involved in organizing and retrieving information, further affecting academic performance. Diagnostic challenges are discussed, focusing on the difficulty of distinguishing EF disorders in children due to overlapping symptoms and developmental variations. Standardized assessments and observational strategies are reviewed, alongside their limitations, in accurately identifying EF impairments. The review highlights how early and accurate diagnosis is crucial, as delays can lead to further complications in social relationships, academic performance, and self-esteem. In addition to exploring the developmental pathways of EF disorders, the article discusses evidence-based intervention strategies aimed at supporting executive function in children. Cognitive-behavioral therapy (CBT), neurofeedback, and mindfulness training are reviewed as effective approaches for improving self-regulation and emotional control. Interventions targeting specific EF components, such as working memory training and computerized attention tasks, are evaluated for their efficacy in enhancing cognitive skills. The review also considers the role of environmental and family-based interventions, including parent training and structured learning environments, in creating supportive contexts for children with EF challenges. Overall, this review underscores the importance of understanding EF disorders not as isolated cognitive deficits but as interconnected challenges that influence a child's entire developmental trajectory. Future research directions are proposed, emphasizing the need for longitudinal studies to better understand the progression of EF disorders and the long-term impact of

interventions. This comprehensive perspective on executive function disorders in children can guide educators, clinicians, and parents in implementing targeted strategies to enhance cognitive, social, and emotional development.

Keywords : 1. Executive Function Disorders 2. Cognitive Impairments 3. ADHD 4. Autism Spectrum Disorder 5. Developmental Interventions

Count: 43
Abstract ID: 726
subject: Cognition: Executive Function (Decision Making, Reasoning, Problem Solving)
Presentation Type: Oral

"A New Perspective: The Imperative to Develop a Verbal Stroop Test for the Iranian Community with New Scoring Methods and Conditions."

Submission Author: SeyyedAsghar Moayedi

SeyyedAsghar Moayedi[1], Iman Bigdeli[2]

1. Department of Psychology, Faculty of Educational Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran
2. Department of Psychology, Faculty of Educational Sciences and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

Conclusion : "A New Perspective: The Imperative to Develop a Verbal Stroop Test for the Iranian Community with New Scoring Methods and Conditions." The Stroop Color-Word Test is a widely recognized neuropsychological assessment tool for measuring inhibitory control, attention, and executive functions. This paper aims to critically evaluate the computer-based Stroop tests employed within the Iranian population, drawing insights from the latest research findings. Utilizing a literature review, this study identifies key indicators that can be employed to assess existing tests and inform the design of a new verbal Stroop test. Research indicates a significant difference in results between the manual and verbal response modalities of the Stroop test, with the verbal condition generally demonstrating greater interference effects. Furthermore, studies emphasize the "Speed-Accuracy Trade-Off" as a crucial factor affecting the reliability of the Stroop test. By considering this trade-off in the scoring process, significant improvements in the reliability of executive function assessments can be achieved. It is posited that, at present, no Stroop test exists among Iranian researchers that adequately addresses the diverse needs of this population while incorporating these vital indicators. Based on the findings, the methodology proposed by Scarpina and Tagini (2017)—which simultaneously assesses both the speed and accuracy of responses while presenting stimuli across three distinct conditions—provides a valuable framework for developing a standardized verbal Stroop test tailored to the Iranian community. Ultimately, this paper underscores the necessity for constructing such a test as a crucial step toward advancing verbal Stroop testing in Iran.

Keywords : color and word stroop test, neuropsychological assessment, inhibition, verbal response

Count: 44
Abstract ID: 257
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Does Age-Related Audio Vestibular Dysfunction Promote Cognitive Decline?

Submission Author: Mehri Maleki

Mehri Maleki[1], Leila Hosseini[2]

1. Department of Audiology, School of Rehabilitation Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Islamic Republic of Iran

Conclusion : Extensive evidence demonstrates the advantages of using auditory/vestibular rehabilitation in the alleviation of handicaps induced by hearing and/or vestibular disorders and the improvement of cognition, social communication, and quality of life. Regular screening of the auditory/vestibular system in the elderly leads to early detection of disorders, rehabilitation planning, and management of hearing and balance disorders.

Keywords : Age-related hearing loss ; cognitive disorders; age-related vestibular disorders; aging

Count: 45
Abstract ID: 129
subject: Cognition: Cognitive Aging
Presentation Type: Oral

Involvement of NLRC4 inflammasome through caspase-1 and IL-1β augments neuroinflammation and contributes to memory impairment in an experimental model of Alzheimer's like disease

Submission Author: Amin Ataie

Amin Ataie[1], Hamid Reza Nouri[2]

1. Babol University of Medical Science , Department of toxicology and pharmacology ,neuroscience research center
2. Immunoregulation Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

Background and Aim : Inflammatory response through interleukin-1β (IL-1β) plays a key role in the pathogenesis of Alzheimer's disease (AD). However, the molecular mechanism of pro-IL-1β processing in AD is not clearly defined. The current study was designed to investigate which of the inflammasome complexes are critical for IL-1β production in AD
Methods : The current study was designed to investigate which of the inflammasome complexes are critical for IL-1β production in AD. An experimental model for Alzheimer like disease was induced in male Wistar rats and Morris Water Maze was used to evaluate the function of learning and memory. The expression of genes involved in inflammasome complex including NLRP1, NLRP3, NLRC4, AIM2, ASC, IL18, IL-1β and caspase-1 was determined via Real-time PCR. Hematoxylin and Eosin (H&E) staining and Immunohistochemistry (IHC) for CD45 was applied to assess inflammatory cells infiltration. Furthermore, caspase-1, IL-1β and phosphorylated tau (p-Tau) protein expressing cells were investigated in the lesion area using immunofluorescence staining technique.
Results : The behavioral study revealed that streptozotocin (STZ) injection significantly impaired learning and memory function. In addition, the infiltration of inflammatory cells was confirmed in the hippocampus region of STZ-treated animals. Furthermore, a significant increase in the expression level of NLRC4 inflammasome, ASC and IL-1β was identified in STZ-treated animals. In contrast, no significant difference was observed in other inflammasome components including NLRP1, NLRP3, AIM2, IL-18 and caspase-1 in STZ-treated group compared with the control group. Moreover, the number of caspase-1, IL-1β and p-Tau protein positive cells were remarkably increased in STZ-treated animals. Based on the obtained results, it can be concluded that increased production of IL-1β, caspase-1 and p-Tau through association with NLRC4
Conclusion : inflammasome may be involved in neuroinflammation and memory impairment in AD, which creates a new horizon in this regard. Hence, strategies targeting NLRC4 inflammasome could be beneficial for the treatment of AD.
Keywords : Alzheimer; Interleukin-1β; Caspase-1; NLRC4; Neuroinflammation; Memory impairment. Abbreviation

Count: 46
Abstract ID: 27
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Cognitive Reserve in the Aging Population Without Dementia

Submission Author: Nazanin Hajjari

Nazanin Hajjari[1], Narges Daneshafrooz [2]

1. Department of Audiology, Faculty of Rehabilitation Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Rehabilitation research center, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran.

Conclusion : The concept of "cognitive reserve" refers to the brain's ability to tolerate age-related or pathological changes, highlighting the flexibility and adaptability of cognitive processes (conscious and subconscious) that account for the varying susceptibility of cognitive abilities and daily functioning to the effects of brain aging and injury. Research indicates that specific genetic and lifestyle factors, such as healthy diets, exercise, reduction of risk for stroke and diabetes, achieving higher education, engaging in more challenging occupations, and participating in leisure and social activities, as well as IQ, are all associated with a lower risk of cognitive decline in normal aging. These factors may help maintain a healthy brain or enhance brain reserve; a process that has been termed "brain maintenance". Many of these lifestyle factors have also been linked to better cognition in other psychiatric and neurological conditions. Studies have shown that IQ and occupational attainment are associated with more successful aging. The cognitive reserve hypothesis proposes that these lifestyle factors result in individual differences in the flexibility and adaptability of brain networks, which may allow some people to cope better than others with age- or dementia-related brain changes. The complementary concept of brain reserve suggests that structural brain features can protect against dementia and related conditions. Since the concept of reserve is shaped by experiences throughout life, targeted studies in this field can increase the likelihood of achieving effective interventions. Thus, cognitive interventions could be designed to reproduce or amplify the effects of formal education on the brain. Evidence suggests that physical activity, especially aerobic exercise and dance, helps preserve brain structure and volume. Cognitive training studies recommend that training executive functions, such as working memory, improves prefrontal network efficiency. Therefore, physical activity, cognitive stimulation, and cognitive training show promise for enhancing cognitive reserve and delaying the onset of dementia symptoms. Future research should continue to explore multimodal lifestyle interventions incorporating these elements.

Keywords : Cognitive reserve; aging; elderly; cognitive ability; cognitive intervention.

Count: 47
Abstract ID: 585
subject: Cognition: Cognitive Aging
Presentation Type: Poster

Age-Related Changes in Working Memory and Problem Solving: A Comparative Curve Estimation Analysis

Submission Author: Zeynab Golchehre rahimi

Zeynab Golchehre rahimi[1], Saeid Dabagh Ghazvini[2]

1. PhD in Psychology, Department of Education Sciences and Psychology, Ferdowsi University, Mashhad, Iran.
2. PhD in Health Psychology, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran.

Background and Aim : There is considerable interest in some executive function like working memory as a factor that might contribute to adult age-related effects on cognitive processes including problem solving. Working memory is our ability to maintain and manipulate data and information to guide goal-directed behaviors. It is involved in a range of complex cognitive behaviors, such as problem solving. Problem solving is a behavioral process that help us to make or choose suitable response for dealing with problematic situation. Working memory and problem solving ability may change by age. The purpose of this study is to examine and consider age- related changing in working memory and problem solving.

Methods : Forty individuals aged 65 and older (25 women and 15 men), and forty-five individuals aged 25-65 participated in this study. The Social Problem- Solving Inventory-Revised: short version (SPSI-R) was assed to measure participants problem solving and N-back task was used to measure working memory.

Results : For the overall sample, Age significantly predicted WM in a linear model for the whole sample ($R^2 = 0.302$), with a negative slope, indicating a decline in WM with increasing age and a cubic model was significant for predicting SPS ($R^2 = 0.376$), suggesting nonlinear fluctuations in SPS with age. The scatter-dot graph further revealed that SPS showed a positive correlation with age in younger participants, no correlation in middle-aged participants, and a negative correlation in older participants, confirming the cubic pattern.

Conclusion : The findings demonstrated decline of working memory in older individuals. Despite similar result didn't confirm in regard to problem-solving. Although there is a correlation between working memory and problem-solving, but the effect of working memory may mediated by obtaining different ways of solving problems or some factors like crystallized intelligence in the elderly.

Keywords : Aging, Working memory, Problem solving.

Count: 48
Abstract ID: 13
subject: Cognition: Attention
Presentation Type: Poster

The effect of Transcranial Direct Current Stimulation (tDCS) on the pattern of alpha and theta brain waves and the process of the attention network in patients with major depressive disorde

Submission Author: Mohammadreza Gholipourfallahy

Mohammadreza Gholipourfallahy[1]

1. Ph.D. student of Cognitive Neurosciences, University of Tabriz

Background and Aim : Generalized anxiety disorder, or GAD, is debilitating, characterized by pervasive, uncontrollable worry. GAD is complex, with a lifetime prevalence of about 1.8% for 12 months (DSM V). In particular, the use and consumption of alcohol has been considered. Studies have shown that high anxiety reduces attention and concentration. According to previous studies, the absolute power of the theta brain waves play a role in attention and the absolute power of the alpha and theta waves are involved with anxiety according to studies with the QEEG device. Transcranial electrical stimulation (tES) is one of the new methods in brain stimulation techniques, which is one of the different forms of this type of brain stimulation, the tDCS method, which is applied by creating a mild and direct electric current through the transcranial skin of the head and face.

Methods : This study was aimed to investigate the effectiveness of direct current movement from tDCS skulls on alpha and theta brain power pattern and visual and auditory evaluation in patients with generalized anxiety disorder. The current research was a single-blind intervention of the clinical trial type, with a pre-test, post-test design with a control group. This research was conducted in 1402-1403 on patients who were suffering from anxiety in Tabriz. In this study, 24 patients with generalized anxiety disorder were divided into two experimental groups (12 people) and a control group (12 people) after initial evaluation by neurologists and psychologists and comprehensive GAD 7 psychological tests. The age group division has been selected for groups up to 40 years old, which have their own rate. For 10 sessions of 30 minutes, the experimental group received a transcranial electrical impulse with an intensity of 2 milliamps in the (OFC) area of Fb1 and Fb2, and alpha and theta brain power were also recorded after the intervention. And finally, the obtained results were analyzed by SPSS software.

Results : As a result, the present study and the obtained results provide strong evidence for the effectiveness of direct transcranial electrical stimulation in modulating alpha and theta brain power patterns and improving visual and auditory attention in patients with generalized anxiety disorder.

Conclusion : Based on the results obtained from this study, there is a significant relationship between the effect of transcranial electrical stimulation and the modulation of alpha and theta waves and the improvement of auditory and auditory attention.

Keywords : generalized anxiety; visual and auditory attention; Transcranial direct current stimulation; Absolute power of alpha and theta

Count: 49
Abstract ID: 255
subject: Cognition: Attention
Presentation Type: Poster

Investigating Mismatch Negativity as a Potential Endophenotype in Drug-Free Children with ADHD

Submission Author: Shadi Moradkhani

Shadi Moradkhani[1], Atoosa Sanglakh Ghoochan Atigh[2], Mehdi Alizade Zarei[3], Fabrice Wallois[4], Mohammad Ali Nazari[5]

1. Department of Cognitive Neuroscience, Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran
2. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran
3. School of Rehabilitation Sciences, Occupational Therapy Department, Iran University of Medical Sciences, Tehran, Iran.
4. Institut National de la Santé et de la Recherche Médicale, Unité Mixte de Recherche 1105, Groupe de Recherches sur l'Analyse Multimodale de la Fonction Cérébrale, Université de Picardie, 80054 Amiens, France
5. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common disorders among children and is known to affect early stages of information processing. One area of particular interest is temporal information processing, an essential auditory skill, which appears to be impaired in children with ADHD and offers a promising avenue for understanding the deficits associated with the disorder. The Research Domain Criteria (RDoC), a neuroscience-based framework, was introduced to explore mental disorders in a way that transcends traditional diagnostic categories. Within this framework, Mismatch Negativity (MMN) has emerged as a valuable electrophysiological marker for examining deficits in ADHD.

Methods : This study specifically investigates changes in the amplitude and latency of the MMN component when basic auditory stimuli differ in duration or inter-stimulus interval (ISI) during an oddball task. We applied this MMN paradigm to compare children with ADHD (n = 25) with a control group of typically developing (TD) children (n = 25). The ADHD participants were referred by an accredited psychiatrist, while the TD group was recruited via social media and online forms. Both groups were matched for gender, age, and IQ to ensure comparability. The psychological assessments included the Conners' Parent Rating Scale (CPRS), Gilliam Autism Rating Scale | Third Edition (GARS-3), Sensory Profile Questionnaire, and the Edinburgh Handedness Inventory.

Results : The results indicated reduced MMN amplitudes in response to both duration- and ISI-based deviations in children with ADHD. Additionally, longer MMN latencies were

observed in both experimental conditions, indicating atypical neural responses in the ADHD group.

Conclusion : These findings were interpreted through the lens of the internal clock model, which suggests that the pace of an internal pacemaker, regulated by dopamine (DA) levels, may be disrupted in children with ADHD. The alignment of MMN abnormalities and timing deficits within the RDoC framework suggests that these electrophysiological measures could serve as potential endophenotypes for ADHD, emphasizing the role of sensory processing in understanding the disorder.

Keywords : ADHD, ISI deviant, duration deviant, Mismatch Negativity (MMN), Auditory Processing, Endophenotype

Count: 50
Abstract ID: 146
subject: Cognition: Attention
Presentation Type: Poster

Investigating the Effects of Vitamin D Supplementation on Brain Mapping and Behavioral Outcomes in Children with ADHD: A Double-Blind Randomized Controlled Trial

Submission Author: Shadi Moradkhani

Shadi Moradkhani[1], Seyed Hamid Mirhosseini[2], Mahdieh Hosseinzadeh[3], Najmeh Maayeshi[4], Hadis Hooshmandi[5]

1. Department of Cognitive Neuroscience, Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran
2. Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical sciences, Yazd, Iran
3. Department of Nutrition, School of public health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
4. Department of Nutrition, School of public health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
5. Department of Nutrition, School of public health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Background and Aim : Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders, often characterized by alterations in brain wave spectra. Neurofeedback, which provides real-time feedback to correct these brain wave abnormalities, presents a promising alternative treatment for ADHD. Additionally, vitamin D deficiency has been shown to impair cognitive function. This study aimed to examine the combined effects of vitamin D supplementation and neurofeedback on the brain mapping of children with ADHD.
Methods : This study was conducted on 42 eligible children with a confirmed diagnosis of ADHD, all of whom underwent multiple sessions of Neurofeedback therapy. The intervention group received a weekly dose of 50,000 IU vitamin D capsules, while the control group was given a placebo for a period of two months. The background brain rhythm was assessed using quantitative EEG both prior to and at the conclusion of the treatment.
Results : The study observes a significant increase in 25(OH)D and serum calcium levels and notable reduction in theta relative power, theta/beta, and theta/alpha power ratios ($p = 0.004$), particularly in the eye-open state ($p = 0.01$) in the vitamin D3 group compared to baseline (respectively $p = 0.001$ and $p = 0.003$). . Connors scores show a significant correlation with improvements in relative theta and theta-to-beta power difference score ($p < 0.001$).
Conclusion : The combined use of vitamin D supplementation and neurofeedback not only increases serum vitamin D levels in children with ADHD but may also lead to more favorable electrophysiological outcomes.
Keywords : ADHD; Mental health; vitamin D; Neurofeedback; Brain mapping

Count: 51
Abstract ID: 224
subject: Cognition: Attention
Presentation Type: Poster

Changing consumer visual behavior (CVB) by using Repetitive Transcranial Magnetic Stimulation (rTMS)

Submission Author: Davoud Sadeh

Davoud Sadeh[1], Hamideh Khalilpour[2], Jalil Gholizadeh Soltani[3]

1. Postdoctoral Researcher, Department of Business Management, Science and Research, Islamic Azad University, Tehran, Iran.
2. PhD, Department of Measurement and Measurement , Saveh Branch, Islamic Azad University, Saveh, Iran.
3. Researcher of neuroscience, Parse Sanat Andisheh Ahooraie Center, Karaj, Iran.

Background and Aim : Visual behavior can reveal important cognitive, emotional, motivational and social characteristics of people, Therefore, changing the visual behavior for the benefit of the consumers will follow the social responsibility of the brands.

Methods : The research method is an exploratory-laboratory type, which has extracted visual data using the GAZEPOINT eye tracker analyzed and modeled by the Logistic Regression in the SPSS software. Two experimental and control groups were analyzed after using TAM brand rTMS, their visual behavior. The statistical population consists of consumers of a bag brand with natural fiber materials, which is shown to 30 women in the form of three images.

Results : The results showed that the control group had more time during stimulus tracking due to the saccade and fixation indicators, and there was a convergence regarding stimulus selection.

Conclusion : Changing visual behavior through interventional methods in order to increase accuracy and focus will lead to better consumer decision-making, the development of future research can be more targeted for financial and economic activities and even reduce gluttony through the social responsibility of brands.

Keywords : eye tracking, rTMS. Behavior

Count: 52
Abstract ID: 215
subject: Cognition: Attention
Presentation Type: Poster

Comparison of children's eye-closed and eye-opened qEEG in predicting attention deficit and response control by using machine learning

Submission Author: Zohreh Asgharian

Zohreh Asgharian[1], Sevda Abbasi[2], Soomaayeh Heysieattalab[3], Farshid Ghobadzadeh[4], Mohammad Ali Nazari1[5]

1. Department of Cognitive Neuroscience (DCN), Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran
2. Department of Cognitive Neuroscience (DCN), Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran
3. Department of Cognitive Neuroscience (DCN), Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran
4. School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
5. Department of Neuroscience, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences (IUMS), Tehran, Iran.

Background and Aim : In cognitive neuroscience studies, extensive efforts have been made to examine the relationship between the brain and behavior, and psychophysiological tools have been used for objective evaluation of cognitive processes. One measurement technique for behavioral variables is electroencephalography (EEG). Nowadays, with advances in quantitative processing of brain signals, precise features can be computed from EEG, referred to as quantitative EEG (qEEG). Due to the association of extracted qEEG parameters with both overt and covert cognitive processes, qEEG is valuable in investigating the brain-behavior relationship. Many studies aim to find neurobiological markers for cognitive assessments using features extracted from EEG. Among these, attention performance is associated with various cognitive processes such as accuracy, concentration, speed, cognitive inhibition, motor inhibition, auditory processing, etc. The Theta-to-Beta Ratio (TBR) has been proposed as an index derived from qEEG for the diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) in children. However, attention function is not limited to ADHD, and it may be associated not only with TBR but also with other qEEG parameters specific to certain attention processes, beyond just ADHD. Some inconsistencies in the application of TBR in ADHD diagnosis may be related to EEG recording conditions during cognitive tasks, open-eye rest (EO), and closed-eye rest (EC). Since the brain function and networks involved in these conditions are not identical, it is hypothesized that the value of TBR for diagnosing ADHD may vary depending on the EEG recording situation. Additionally, studies have shown that other qEEG parameters, such as delta power, alpha power, and theta-to-alpha ratio, are related to attention deficits.

Methods : The study compares open-eye and closed-eye qEEG recordings in predicting attention and inhibitory response deficits in children. Utilizing machine learning with support vector machine (SVM) algorithms, the research addresses data collinearity by training a model on pre-classified data to classify new inputs. Attention is evaluated using a comprehensive visual and auditory test (IVA-2). The sample consists of 600 children aged 7 to 11, with qEEG recordings lasting 3 minutes each condition. SVM is selected for its accuracy, confirmed by permutation tests, while paired t-tests assess differences in classification accuracy between the open-eye and closed-eye conditions.

Results : Indicate that open-eye qEEG has higher predictive capabilities for attention deficits compared to closed-eye qEEG, with an accuracy of 0.63 in 2 classes, 0.46 in 3 classes, 0.36 in 4 classes, and 0.28 in 5 classes. Additionally, open-eye qEEG does not show predictive capabilities for inhibitory response deficits.

Conclusion : •The study found that open-eye qEEG recordings are more accurate in predicting attention deficits in children than closed-eye qEEG, indicating better capture of attention-related neural markers in open-eye conditions. •While effective for attention deficits, open-eye qEEG did not predict inhibitory response deficits, suggesting that attention and inhibition rely on distinct neural mechanisms. •These findings emphasize the need to consider EEG recording conditions (open-eye vs. closed-eye) when analyzing cognitive functions, as they engage different brain networks. •Support Vector Machines (SVM) effectively analyzed complex qEEG data, yielding valuable classifications, but further refinement of models is needed to improve accuracy across cognitive processes.

Keywords : Attention; Eye-closed; Eye-opened;Machine learning; Quantitative electroencephalogram; Integrated visual and auditory

Count: 53
Abstract ID: 263
subject: Cognition: Attention
Presentation Type: Poster

Morning preference is associated with better visual memory in students

Submission Author: Bita Dadjou

Bita Dadjou[1], Tayebeh Mohtashami [2], Behzad Garmabi [3]

1. Department of Clinical Psychology, Shahrood Branch, Islamic Azad University, Shahrood, Iran
2. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
3. Center for Health Related Social and Behavioral Sciences Research, Shahroud University of Medical Sciences, Shahroud, Iran. Department of Neuroscience, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Background and Aim : The circadian rhythm is observable in almost all biological functions. Based on the preference for daily sleep-wake behavior or rest, physical or mental performance, the human population is classified into three categories: Morning types are early risers, perform better in the morning physically and mentally, and go to bed early at night. In contrast, evening types wake up later, stay awake until late, and prefer evening hours for activities. The intermediate type displays characteristics of both groups. Although many studies have examined the role of morning-evening chronotypes in cognitive processes, the results across studies are inconsistent, and the impact on visual memory has been less explored. This research aimed to compare morning and evening chronotypes in terms of visual memory among university students.

Methods : In this cross-sectional study, 178 students from Shahroud University of Medical Sciences (95 women and 83 men) with an average age of 22 were selected through convenience sampling. They were asked to perform the Pattern Recognition Memory (PRM) test using CANTAB software. Additionally, sleep and wake parameters were measured using the Munich Chronotype Questionnaire (Roenneberg et al., 2003). For the PRM test, participants were shown a series of visual patterns they had to memorize, and after a 20-minute delay, they were asked to recognize the previously seen patterns. These patterns were designed in such a way that they could not easily be described verbally. In the recognition phase, participants had to choose between a previously seen pattern and a new one. At this stage, the test patterns were presented in reverse order compared to the initial presentation.

Results : Data were analyzed using ANOVA. The results showed a statistically significant difference in the number of correctly recognized patterns between morning and evening chronotypes ($p = 0.037$). In other words, morning types recognized more correct patterns than evening types. The study also found no significant gender differences in visual memory, but older participants took more time to correctly select patterns ($p = 0.049$).

Conclusion : The results indicate higher visual memory in morning chronotypes. Therefore, educational activities based on individuals' chronotypes may help increase productivity and improve cognitive performance. Future studies are recommended to investigate how chronotype and circadian rhythms can improve learning and memory processes.

Keywords : Circadian rhythm, Morning-Evening Chronotypes, Pattern Recognition Memory, CANTAB

Count: 54
Abstract ID: 273
subject: Cognition: Attention
Presentation Type: Poster

Evening individuals have better emotional cognition compared to morning individuals

Submission Author: Zeynab Ghorbansani

Zeynab Ghorbansani[1], Tayebeh Mohtashami [2], Behzad Garmabi [3]

1. Department of Clinical Psychology, Shahrood Branch, Islamic Azad University, Shahrood, Iran.
2. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
3. . Center for Health Related Social and Behavioral Sciences Research, Shahroud University of Medical Sciences, Shahroud, Iran . Department of Neuroscience, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Background and Aim : Perception, interpretation and response to emotional messages are influential parts in interpersonal life. Recognizing emotion using facial expressions is a key element in human communication, so adjusting the relationship between emotion and cognition can help increase healthy performance. According to the study background, the rhythm of cognitive functions is influenced by circadian rhythms and people show different functions according to these differences. Studies have also shown that there is a significant difference in the amount of experience of positive and negative emotions based on morning-evening types. Therefore, the aim of the current study was to compare emotional cognition based on morning-evening types.

Methods : The current research was descriptive and correlational. 173 students studying in Shahroud universities participated in the current research and filled out the Munich chronotype questionnaires (Roenneberg et al., 2003) and emotional recognition test (ERT) using of CANTAB software. In this test, face images of real people who show certain emotions and have been converted into computer-altered images are shown to the participant. For each type of emotion, there are 15 stimuli that are arranged in such a way that in the early stages when that emotion is displayed, the participant has a high recognition ability for that emotion. After the face image is presented, the six main emotions are displayed and the participant must choose the emotion they think is most closely related to the emotion displayed in the image. This test is performed in two blocks of 90 cases. The data were analyzed using SPSS version 23 software and step-by-step regression analysis and analysis of variance.

Results : The findings of the research showed that the onset of sleep on free days (r=10.18, p=0.002) and the duration of sleep on working days (r=7.84, p=0.001) predict emotional cognition. In other words, sleeping earlier on free days (B = 0.86) has a positive effect and reducing the duration of sleep on working days (B = -0.91) has a negative effect on the emotional intelligence score. Also, the results of the present study showed that evening type people have better emotional recognition than morning type people.

Conclusion : According to the present study, it seems that sleeping early on free days and sleep duration during working days are important variables for higher emotional cognition, so programs for sleep hygiene are suggested. It seems that the modern era has affected our lifestyle so that the evening preferences among people have become a choice, and more studies in this field are suggested.

Keywords : Chronotype, Morning-Evening types, Emotional Recognition, CANTAB.

Count: 55
Abstract ID: 277
subject: Cognition: Attention
Presentation Type: Poster

Comparison of circadian typology in verbal memory

Submission Author: Sahar Mahmoudi

Sahar Mahmoudi[1], Tayebeh Mohtashami[2], Behzad Garmabi [3]

1. Department of Clinical Psychology, Shahrood Branch, Islamic Azad University, Shahrood, Iran.
2. Student Research Committee, Faculty of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran.
3. Research Center for Health-Related Social and Behavioral Sciences, Shahroud University of Medical Sciences, Shahroud, Iran. 4- Department of Neuroscience, Faculty of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran.

Background and Aim : Memory is an important cognitive process for human performance, which is influenced by circadian rhythms. Circadian rhythms are internal processes that regulate physiological and behavioral cycles every 24 hours based on the light-dark cycle. Circadian rhythms are different among people, which is called chronotype. Studies have shown that circadian rhythms affect cognitive functions. Therefore, the present study examines the comparison of morning-evening chronotype on verbal memory.

Methods : The current research was descriptive and correlational. 174 students studying in Shahroud universities participated in this study. Munich Chronotype Questionnaire (Roenneberg et al., 2003) and Verbal Recognition Memory (VRM) on CANTAB software were used in this study. It evaluates verbal memory in free recall and recognition conditions. A list of 18 words was shown to the participants and then the participants were asked to recall the words as quickly as possible after the presentation. In the second stage, the participants must identify which of the 36 words that are being shown to them, they have seen before. Data were analyzed using SPSS version 23 software and variance analysis method.

Results : The findings of the study showed that in the free recall phase, in terms of the number of new recalled words (which are considered errors), there is a significant difference between morning and intermediate (p=0.049) and evening (p=0.018) chronotypes. In other words, the results showed that people with morning chronotype have a weaker performance in the verbal memory test compared to people with evening chronotype. Also, the results showed that there is no significant difference between types of chronotype in terms of verbal recognition memory.

Conclusion : Since students with evening chronotype had better verbal memory compared to the morning people, this finding indicates the importance of chronotypes in learning opportunities and discovering optimal performance based on individual characteristics.

Keywords : Circadian Typology, Chronotype, Verbal Recognition Memory, CANTAB.

Count: 56
Abstract ID: 262
subject: Cognition: Attention
Presentation Type: Poster

Comparison of Morning-Evening chronotype in students' attention flexibility

Submission Author: Mohadeseh Goli

Mohadeseh Goli[1], Tayebeh Mohtashami [2], Behzad Garmabi [3]

1. Department of Clinical Psychology, Shahrood Branch, Islamic Azad University, Shahrood, Iran.
2. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran.
3. Center for Health Related Social and Behavioral Sciences Research, Shahroud University of Medical Sciences, Shahroud, Iran. . Department of Neuroscience, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran.

Background and Aim : Studies have introduced circadian rhythms as an effective factor in alertness and attention. The circadian rhythm or the periodic changes and biological fluctuations has a period of 24 hours, which can impose various ups and downs on people's alertness and attention. On the other hand, studies have shown that the level of energy, followed by the level of concentration and attention varies throughout the day and night and some people perform better in the morning and some in the evening. The present study investigates the comparison of morning-evening chronotype on the flexibility of attention.

Methods : The statistical population of the research included all students studying in Shahroud City. Among the available students, 173 people were selected as the study sample. The Munich Chronotype Questionnaire (Roenneberg et al., 2003) and the CANTAB software to measure the flexibility of attention were used. This test is performed in 9 blocks and individual errors are calculated in each step. In block one, two simple patterns are presented to the participant, which include colored shapes. One has to learn the correct pattern by touching the stimuli and continue until the criterion is reached. In block two, the probabilities are reversed so that the stimulus or target that was previously false is now true. In block six, a new stimulus combination is presented to the participant (lines are added to shapes). This process continues until 9 blocks are performed, which takes about 7 to 10 minutes.

Results : The findings showed that there is a statistically significant difference between the intermediate and morning chronotype ($p = 0.013$) and the intermediate and evening chronotype ($p = 0.023$). In other words, compared to other types of chronotype, the total error in morning chronotype people is less, and this difference is statistically significant only with the intermediate type and no significant difference is seen with the evening type people.

Conclusion : Paying attention to students' chronotype and considering the morning/evening type in educational processes is suggested for better cognitive functions, including attention.

Keywords : Morning-Evening chronotype, attention flexibility, CANTAB.

Count: 57
Abstract ID: 563
subject: Cognition: Attention
Presentation Type: Poster

Components of attention bias to emotional stimuli and its effect on anxiety and depression

Submission Author: Ali Sayadi

Ali Sayadi[1]

1. Department of Psychology, Faculty of Psychology and Human Sciences, Central Tehran Branch, Islamic Azad University, Iran. Email: Sayadi20200@Gmail.com

Background and Aim : The aim of this study was to examine the components of attentional bias to emotional stimuli and its impact on anxiety and depression. Attentional bias refers to an unconscious tendency to focus more on negative and threatening stimuli, particularly in individuals with high levels of anxiety and depression.

Methods : This study was conducted using a descriptive-correlational design. A sample of 200 individuals referred to psychology clinics was randomly selected and asked to participate in standardized attentional bias tests as well as anxiety and depression scales. The Emotional Stroop Task was used to assess attentional bias, while the levels of anxiety and depression were measured through standardized questionnaires, such as the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI).

Results : Findings revealed that individuals with higher levels of anxiety and depression spent more time processing negative emotional stimuli and demonstrated greater attentional bias toward these stimuli. Moreover, regression analysis results showed that attentional bias toward emotional stimuli was significantly correlated with increased symptoms of anxiety and depression.

Conclusion : The results of this study suggest that attentional bias toward negative stimuli can serve as a contributing factor in the exacerbation and maintenance of anxiety and depression. These findings highlight the importance of therapeutic interventions, such as attention retraining, which can reduce attentional bias and, consequently, alleviate anxiety and depression.

Keywords : Attentional bias; emotional stimuli; anxiety; depression; attention retraining; Emotional Stroop Task

Count: 58
Abstract ID: 491
subject: Cognition: Attention
Presentation Type: Poster

The effectiveness of LORETA Neurofeedback in Student (6-15 Years Old) with attention deficit hyperactivity disorder

Submission Author: Bahar Abedikanzagh

Bahar Abedikanzagh[1], Mohsen Dadkhah[2], Yaser Dadkhah[3]

1. third author - Bachelor of Psychology, Islamic Azad University, West Tehran Branch, Tehran, Iran
2. first author -Master of Psychology, Psychotherapist, Setareh Iranian Counseling Center, Tehran, Iran
3. second author -PhD,neuropsychology, Setareh Iranian Counseling Center, Tehran, Iran

Background and Aim : Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent developmental disorders in children, affecting about 5% of school-aged children and 2.5% of adults. Characterized by inattention, hyperactivity, and impulsivity, ADHD can severely impact academic, social, and emotional functioning. A significant number of children with ADHD, ranging from 45% to 84%, also exhibit Oppositional Defiant Disorder (ODD), and nearly one-third have comorbid mood or anxiety disorders. ADHD disrupts attention, response control, and emotional regulation, leading to challenges in behavioral inhibition and sustained attention. Core deficits in inhibitory control are linked to various executive function impairments associated with ADHD. Furthermore, individuals with the disorder often face psychological issues, including depression, anxiety, and low self-esteem. Neuroimaging studies highlight the importance of subcortical brain regions, such as the striatum and amygdala, in ADHD. Research indicates altered white matter integrity in widespread fiber tracts and increased gray matter volume in bilateral frontal regions among affected children. Additionally, disruptions in neural networks related to attention and cognitive control have been observed, particularly in children over the age of eight. Proposed treatments for ADHD include pharmacological options, behavioral interventions, parent training, cognitive training, and physical exercise. While psychostimulant medications are common, they can have side effects and may be ineffective for about 30% of individuals. Computer-based cognitive training programs have shown some therapeutic effects; for instance, an attention processing training program delivered over three months demonstrated positive outcomes, albeit with a modest effect size. Other studies suggest that computerized attention and activity tests may aid decision-making in children and adolescents with ADHD. However, some research has found that computer-based training might not be effective for all individuals with ADHD, indicating a need for further investigation into the efficacy of such interventions.

Methods : This study employs a multi-case design using an A-B-A design. In Phase A, the child's symptoms are assessed before the intervention with Loretta using brain. In Phase B, the child undergoes an 4-week treatment with Loretta. In Phase A, the child's symptoms are reassessed after the intervention with Loretta using brain mapping.

Results : The results showed that Loretta Neurofeedback therapy significantly improved attention and Concentration in children with ADHD. Therefore, LORETA may have the potential to alter the structural and functional brain characteristics related to response control."

Conclusion : In conclusion, neurotherapy training appears to be an effective intervention for improving attention and concentration in children with ADHD. By targeting specific cognitive processes and utilizing strategic training methods, this approach shows promise in addressing attentional deficits associated with ADHD. Nonetheless, further research is needed to explore the long-term effects and cost-effectiveness of such interventions.

Keywords : ADHD, LORETA, Attention Deficit, hyperactivity disorder

Count: 59
Abstract ID: 731
subject: Cognition: Attention
Presentation Type: Poster

Attachment Styles and Pain Perception in Women with Premenstrual Syndrome: The Mediating Role of Attentional Bias

Submission Author: MALIKEH MOVAHHEDABTAHI

MALIKEH MOVAHHEDABTAHI[1], SHILA KERMANI[2]

1. MASTER OF COGNITIVE REHABILITATION.SHAHID BEHESHTI UNIVERSITY
2. MASTER OF HEALTH PSYCHOLOGY.ISFAHAN UNIVERSITY

Conclusion : This study highlights the role of insecure attachment styles in intensifying pain perception among women with PMS, mediated by attentional bias. The findings underscore the importance of targeting both attachment-related insecurities and cognitive biases in managing chronic pain. Cognitive-behavioral interventions that address attentional bias could offer effective strategies for reducing pain perception and improving quality of life in this population. Future research should explore longitudinal designs and broader samples to confirm these findings and extend their applicability.

Keywords : Attachment Styles, Pain Perception, Premenstrual Syndrome, Attentional Bias, Chronic Pain, Cognitive Bias

Count: 60
Abstract ID: 601
subject: Cognition: Attention
Presentation Type: Poster

Hemispheric Insights into Visual Binding: Examining Errors in Object Recognition

Submission Author: Sevda Motevalli

Sevda Motevalli[1], Mahta Mahboubi[2], Borhan Beigzadeh[3]

1. Iran University of Science and Technology, IUST
2. Iran University of Science and Technology, IUST
3. Iran University of Science and Technology, IUST

Background and Aim : Vision is a sophisticated sense that relies on both brain hemispheres to merge images from each eye, creating a three-dimensional vision. The right visual field is processed by the left hemisphere and vice versa. Damage to either hemisphere can impair vision. The primary visual cortex plays a critical role in object recognition, utilizing cells that respond to various orientations. This study investigates how each hemisphere contributes to visual binding and errors in perception, employing specialized apparatus to isolate visual input to each eye for precise analysis.

Methods : Participants were presented with two distinguishable objects, "T" and "L," on a screen under different conditions that varied by color, orientation, shape, and spatial location. Each object was displayed for 17 milliseconds. Twelve participants completed 10 trials in a controlled environment, with data collected via MATLAB to explore how the brain's hemispheres contribute to visual binding and perception errors.

Results : 32 stimuli have been tested across three conditions: non-prominent, distinct prominent features, and simultaneous prominent features. ANOVA revealed no significant differences in response times. However, increased color saliency led to higher errors in binocular conditions. Monocular tasks showed lower accuracy. Results underscore the impact of feature prominence on visual binding.

Conclusion : This study reveals hemisphere-specific differences in visual binding and object recognition. Recognition errors varied between hemispheres, with color saliency and feature prominence influencing accuracy. Increased color saliency led to more errors, especially in binocular conditions. Features within a single object were recognized more accurately than those spread across multiple objects. These findings enhance our understanding of visual perception and have potential applications in AI and robotics.

Keywords : Visual search, Brain function, Binding, Brain hemispheres

Count: 61
Abstract ID: 576
subject: Cognition: Attention
Presentation Type: Poster

The effects of Epilepsy on Attention Deficit and Hyper Activity Disorder in Children

Submission Author: Elham Zare

Elham Zare[1], Somaye Hesami[2], Seyed Sajjad Alavi Kakhki[3]

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

Conclusion : Introduction: Epilepsy and Attention Deficit Hyperactivity Disorder (ADHD) are prevalent conditions in pediatric populations that can significantly influence the developmental trajectory and quality of life in affected children. While both disorders can independently affect attention and behavior, there is emerging evidence suggesting a bidirectional relationship. This review aims to consolidate findings from recent studies to understand the interplay between epilepsy and ADHD, focusing on prevalence rates, symptomatology, cognitive effects, and treatment considerations. Materials and Methods: A systematic literature review was conducted using databases including PubMed, Scopus, and PsycINFO. Keywords such as "epilepsy," "ADHD," "children," and "comorbidity" were utilized to identify relevant studies published between 2000 and 2023. Inclusion criteria comprised peer-reviewed articles discussing clinical correlations, treatment outcomes, and neuropsychological assessments in children with both epilepsy and ADHD. A total of 35 studies were selected for detailed analysis. Results: The review revealed that children with epilepsy are significantly more likely to exhibit ADHD symptoms, with prevalence rates estimated between 20% to 30%. Key findings suggest that the type and frequency of seizures are correlated with the severity of ADHD symptoms, particularly inattention and impulsivity. Furthermore, cognitive assessments indicated that children with co-existing epilepsy and ADHD often demonstrate deficits in executive functioning and processing speed, which complicate behavioral management. Discussion: The evidence indicates that the coexistence of epilepsy and ADHD requires nuanced clinical approaches. Treatment strategies often need to be adapted, as the side effects of antiepileptic medications can exacerbate ADHD symptoms. Interdisciplinary management, involving pediatricians, neurologists, and mental health professionals, is essential to provide comprehensive care. The review also highlights the necessity for early identification and intervention to improve outcomes in children affected by both conditions. Conclusion: This review emphasizes the critical link between epilepsy and ADHD in children, revealing a complex interplay that warrants further investigation. It is imperative for healthcare providers to recognize the high prevalence of ADHD among children with epilepsy and to implement tailored treatment plans that address the unique challenges presented by this comorbidity. Future research should focus on longitudinal studies to elucidate causal mechanisms and develop more effective intervention strategies.

Keywords : Epilepsy, ADHD, children, comorbidity

Count: 62
Abstract ID: 484
subject: Cognition: Neurolinguistics
Presentation Type: Poster

Language and Thought are Dissociable in Humans and Large Language Models: A Review

Submission Author: Matin Khanpayeh

Matin Khanpayeh[1], Linda Shabani[2]

1. M.Sc. student in Clinical Psychology, Kurdistan University of Medical Sciences, Department of Clinical Psychology
2. Medical Student, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Conclusion : Language as a hallmark of humanities evolution, has long been regarded as linked to thought processes. However recent research has challenged this argument and positing that language's primary function is a tool for communication rather than a prerequisite for thoughts. Cases of global aphasia provides evidence for this dissociation. Due to massive left-hemisphere strokes and experiencing severe impairments in language comprehension and production, these patients demonstrate remarkable cognitive abilities and able to solve logical problems and they can also think of what other people are thinking. This finding together reveals that not only are language and thought dissociable in human brain but also many aspects of thought can proceed in the absence of language. In other words, the mechanisms that process language in the human brain do not support non-linguistic cognitive tasks. fMRI studies have shown that the brain's language system constitutes a distinct component of the mind and brain that is specific for language processing, separable from other cognitive systems. It does not indicate that the language system is acting alone but it must also interact with higher-level components of the mind and brain. This disconnection between language and thought is further illuminated by recent advancements in artificial intelligence, particularly in the domain of large language models (LLMs). While LLMs have made unprecedented strides in replicating human linguistic capabilities, they have exposed the limitations of language as a proxy for human thoughts and cognitive systems. The recent language networks support both comprehension (spoken, written, and signed) and production. however, as their whole processing system relies on language alone, they do not support non-linguistic cognition as humans do. This sharp dissociation suggests, in examining language models' functionality, we should separate their linguistic abilities from their abstract knowledge and reasoning abilities, and we could learn from this that although these models improve at replicating human language patterns, they inadequately reflect human cognitive and thought processes.

Keywords : language and thought; Large Language Models; cognitive neuroscience; linguistic competence

Count: 63
Abstract ID: 453
subject: Cognition: Neurolinguistics
Presentation Type: Poster

The role of attention performance in the comprehension of complex syntactic sentences in dyslexic children

Submission Author: Mostafa Mazloumi

Mostafa Mazloumi[1], Mehdi Purmohammad[2]

1. Brain and Cognition Clinic, Tehran, Iran
2. Researcher, Department of Education, University of Alberta, Canada

Background and Aim : Dyslexia is a specific learning disorder with a neurobiological basis. Challenges in reading skills and other difficulties often stem from phonological deficits, which are frequently linked to other cognitive abilities. Secondary consequences include impaired reading comprehension, reduced reading experience, and, consequently, limited vocabulary growth. Recent research has revealed that this disorder extends beyond reading difficulties to involve other areas such as working memory, attention, language, and information processing. For instance, understanding auditory material may also be challenging, alongside reading difficulties. Comprehension issues with sentences of complex syntactic structure arise due to factors including 1) specific linguistic deficits related to syntax, 2) cognitive deficits underlying language comprehension, and 3) secondary effects resulting from limited reading experience. Passive sentences, being syntactically more complex than active sentences, are of particular research interest. This study aimed to investigate the role of auditory attention performance in the comprehension of syntactically and semantically complex sentences in dyslexic individuals and compare it with a matched control group. By exploring the relationship between these cognitive functions and analyzing sentence comprehension through behavioral data, we aimed to develop a profile of additional diagnostic information for these individuals. Deficits in cognitive functions, such as auditory attention and auditory comprehension, can impede learning and academic progress in dyslexic individuals; therefore, addressing these underlying issues is crucial for preventing secondary complications.

Methods : A total of 30 students with dyslexia, along with a control group, participated in this study. (mean age=10.7 ± 1.6). The main tests employed in this study included the auditory language comprehension test and the auditory sustained attention test. In the auditory comprehension test, students were presented with 120 sentences under various conditions: simple, syntactically complex, semantically complex, and both syntactically and semantically complex. Following each sentence, participants answered questions, delivered aurally, regarding the identification of grammatical roles, using a keyboard to respond. Additionally, in the auditory sustained attention test, participants responded to target auditory stimuli via keyboard for a duration of 15 minutes.

Results : Results from the auditory attention test indicated that the dyslexic group had a lower average of correct answers compared to the control group, suggesting weaker performance in

auditory attention. Similarly, the dyslexic group performed worse on the auditory comprehension test, with fewer correct answers and longer reaction times than the control group. Dyslexic individuals exhibited more pronounced difficulties with auditory attention compared to their non-dyslexic peers. Their performance in auditory sentence comprehension was also poorer, as they require more time to respond to comprehension questions and tend to make more errors.

Conclusion : The results suggest that auditory language processing in dyslexics is impaired, potentially due to deficits in auditory attention. However, as syntactic and semantic complexity increases, both groups show a decline in comprehension performance. Despite differences in auditory attention between the two groups, both dyslexics and non-dyslexics exhibited more delays and errors when processing unfamiliar and unacceptable sentences. One interpretation of these findings is that auditory language comprehension in dyslexics may be affected by deficits in auditory attention. However, comprehension difficulties with syntactically and semantically complex sentences may also arise from language-specific deficits in these individuals.

Keywords : Dyslexia; syntax comprehension; Auditory comprehension; Auditory attention; Learning disorder; Passive sentences comprehension

Count: 64
Abstract ID: 232
subject: Cognition: Neurolinguistics
Presentation Type: Oral

Activation of the Supplementary Motor Area (SMA) during auditory sentence processing

Submission Author: Simin Meykadeh

Simin Meykadeh[1]

1. PhD in Linguistics, Tarbiat Modares University, Tehran, Iran; PhD visiting scholar, Institut für Psychologie, Humboldt-Universität zu Berlin, Berlin, Germany

Background and Aim : It has been shown that the Supplementary Motor Area (SMA), apart from its function in speech motor control, has various superordinate control functions during speech communication and language reception. The aim of this study is to investigate the role of this brain region in high-order representations of language structures in terms of morphosyntax in highly-proficient bilingual papulations using functional Magnetic Resonance Imaging (fMRI).

Methods : Thirty-six bilinguals (21 females) were selected based on the purposive sampling technique from the statistical population of Turkish-Persian bilingual PhD students of top public universities in Tehran, in 2020. All participants were native speakers of Turkish and learned Persian at school from the age of seven. During a bilingual grammaticality judgement task, participants heard 128 test sentences (64 in L1 and 64 in L2, with 50% violation per language) and made thier judgment by pressing a button. Stimuli were presented using the Psychtoolbox in MATLAB via headphones. Stimuli were randomized for each conditions, but alternated in a fixed sequence for language. MRI data were collected in NBML, Tehran, using a Siemens Prisma 3T scanner with a 20-channel head coil. For each participant, a high-resolution T1-weighted anatomical scan was acquired. After the anatomical scan, participants underwent a 21.5-min fMRI scan that used a whole brain echo planar imaging (EPI) sequence. Processing of the fMRI data was carried out using FEAT in FSL. Preprocessing steps included motion correction, slice-timing correction, non-brain removal using BET, spatial smoothing (6 mm FWHM), normalization, temporal filtering (with sigma = 50.0 s), and exploratory ICA-based data analysis. Statistical analyses of fMRI data were conducted using general linear modeling (GLM), as implemented in FSL. Z statistic images were thresholded using clusters determined by $Z > 3.1$ and a (corrected) cluster significance threshold of $P < 0.05$. After detecting the SMA activation in the whole-brain analysis, percent signal changes were extracted as an intensity measure in this brain region. All statistical analyses were conducted in IBM SPSS Statistics 26.

Results : The results showed main effects of Language and Grammaticality with stronger BOLD signal in L1 and most clearly for ungrammatical stimuli as compared to L2 and grammatical stimuli respectively in SMA. Furthermore, there was a significant interaction between Grammaticality effect and Hemisphere such that the ungrammatical conditions

elicited stronger activation at right hemisphere than left hemisphere, confirming that the right SMA is more involved in auditory processing of syntactic structure.

Conclusion : The current study provides insights regarding SMA activation during auditorily syntactic processing in high-proficient bilinguals. These findings also suggest the involvement of the right SMA in language control and highlight its contribution in more abstract representations of linguistic structures.

Keywords : Supplementary Motor Area; Bilingualism; L1; sentence processing

Count: 65
Abstract ID: 713
subject: Cognition: Neurolinguistics
Presentation Type: Poster

The Role of Language in Visual Detection: A Review of Cognitive and Perceptual Interactions

Submission Author: Narges Kazerooni

Narges Kazerooni[1]

1. PhD student of cognitive psychology, Department of Cognitive Psychology, Research Institute of Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Conclusion : Abstract: This review explores the complex interplay between language and visual detection, shedding light on how linguistic constructs shape and modulate our perceptual experience. Recent research in cognitive science and psycholinguistics suggests that language does more than label perceptual information; it influences fundamental aspects of visual attention, feature detection, and categorization. Studies show that language can guide attention to specific visual features, enhancing detection accuracy and speed for relevant stimuli. For instance, speakers of languages with more fine-grained color terms have demonstrated heightened sensitivity to color variations, suggesting that language may scaffold visual distinctions. Similarly, language affects object detection by influencing categorical perception, whereby naming an object primes certain perceptual features, thus enhancing recognition speed and accuracy in visual tasks. A key area of focus is the role of language in shaping visual detection across different cultural and linguistic backgrounds. Cross-linguistic studies reveal that speakers of different languages, who categorize spatial or temporal information differently, show corresponding variations in spatial and temporal visual detection tasks. Moreover, bilingual and multilingual individuals often exhibit unique detection patterns depending on the language context, suggesting that language can dynamically alter visual processing depending on linguistic context. This review synthesizes current empirical findings on how language modulates visual detection, examining neural and behavioral evidence for language-perception interactions. Understanding the mechanisms underlying these effects offers potential applications in areas such as cognitive health, artificial intelligence, and cross-cultural communication. It underscores the necessity of considering linguistic factors in models of perception and attention and highlights promising directions for future research, particularly in disentangling the effects of linguistic diversity and individual language proficiency on visual detection.

Keywords : Language-perception interaction Visual detection Categorical perception

Count: 66
Abstract ID: 383
subject: Cognition: Other
Presentation Type: Poster

Sex differences in hippocampal long-term potentiation at perforant pathway-dentate gyrus (PP-DG) synapses in Wistar rats

Submission Author: Samaneh Safari

Samaneh Safari[1], Nesa Ahmadi[2], Reihaneh Mohammadkhani[3], Reza Ghahremani[4], Maryam Khajvand-Abedeni[5], Siamak Shahidi[6], Alireza Komaki[7], Iraj Salehi[8], Seyed Asaad Karimi[9]

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. Department of Exercise Physiology, Faculty of Sport Sciences, University of Birjand, Birjand, Iran
5. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
6. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
7. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
8. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
9. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Recent studies show that gender may have a significant impact on brain functions. Men and women appear to have different strategies for decision-making and memory encoding. Because the nervous system controls cognitive behaviour, these sex-related functional differences may be associated to the sex-specific structure of the neuronal circuits in the nervous system. However, the reports of sex effects on synaptic plasticity in rodents are divergent and controversial. Here to assess sex difference in hippocampal synaptic plasticity we examined hippocampal long-term potentiation (LTP) at perforant pathway-dentate gyrus (PP-DG) synapses.

Methods : We studied LTP at PP-DG synapses in urethane-anesthetized rats to evaluate sex differences in hippocampal synaptic plasticity. Male and female rats were tested for probable differences in PP-DG LTP induction. Before and after high frequency stimulation in PP, the extracellular field potentials were recorded in the DG area. LTP was determined by examining HFS-induced changes in the fEPSP slope and PS amplitude.

Results : The magnitude of fEPSP slope LTP varied with sex of the rats. Males exhibited significantly more fEPSP slope LTP than female rats. The percentage change in fEPSP slope after HFS was significantly lower in female rats than in male rats. Also male rats exhibited significantly more PS amplitude LTP than female rats. The percentage change in PS amplitude after HFS was significantly lower in female rats than in male

Conclusion : The present study investigated sex differences in and synaptic plasticity. Sex differences in LTP were also evident in the PS amplitude and the slope of fEPSP at PP-DG synapses. Male rats exhibited significantly more PS amplitude and fEPSP slope than female rats. Lack of determination of the estrous cycle stage and the corticosterone levels may be limitations of the present study, which should be considered in future studies.

Keywords : Long-term potentiation; Hippocampus; Dentate Gyrus; Sex difference; Wistar Rat

Count: 67
Abstract ID: 566
subject: Cognition: Other
Presentation Type: Oral

Atorvastatin's role in extinction and reinstatement prevention of morphine conditioned preference through BDNF upregulation in rats

Submission Author: Shiva Hashemizadeh

Shiva Hashemizadeh[1], Elham Alaee[2], Niloofar Aghajani[3], Hossein Azizi[4], Saeed Semnanian[5]

1. School of Cognitive Sciences, Institute for Research in Fundamental Sciences, IPM, Tehran, Iran.
2. Institute for Brain and Cognition, 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
5. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Opioid addiction is recognized as a chronic, relapsing disorder characterized by persisten molecular and cellular changes in the brain that result in compulsive behaviors.Individuals can remain highly susceptible to relapse even after prolonged periods of abstinence, primarily due to the profound impact of morphine on the brain's reward system. The high rates of relapse underscore the urgent need for innovative treatment approaches that can assist individuals in overcoming their addiction and achieving sustained recovery. Despite attempts to deploy established therapies for treating morphine addiction, their effectiveness has often fallen short of expectations. The high rates of relapse underscore the urgent need for innovative treatment approaches that can assist individuals in overcoming their addiction and achieving sustained recovery. Recent studies have indicated that statins—medications typically used to lower cholesterol levels—may offer therapeutic advantages for various central nervous system (CNS) disorders. This study aimed to explore the potential of statins as novel pharmacological agents to reduce the risk of reinstating morphine-seeking behavior

Methods : The conditioned place preference (CPP) paradigm was conducted with extinction training phase followed by a reinstatement assessment. Adult male Wistar rats were administered morphine (5 mg/kg) for three consecutive days to establish a preference for morphine. After this acquisition phase, the rats were divided into three subgroups receiving different treatments: statin at 0.1 mg/kg, statin at1.0 mg/kg, and a vehicle control. All rats received their respective treatments one hour before the extinction training during the drug abstinence period, after which they were re-exposed to the drug in the CPP paradigm to observe potential relapse. CPP scores were measured during both the extinction and relapse phases. The gene expression of BDNF and mu opioid receptor in hippocampus, PFC and NAc was measured by real-time PCR technique

Results : As a result, we found that systemic administration of atorvastatin before each extinction training, was capable of facilitating extinction in the non-confined CPP extinction paradigms and blocking the morphine-primed reinstatement of morphine-induced CPP. Additionally, we also observed that the atorvastatin treatment during extinction training altered

expression of brain-derived neurotrophic factor (BDNF), OPRM1 receptors in the PFC and Hippocamp without change in nucleus accumbens (NAc). Moreover, the pre-extinction atorvastatin treatment significantly reduced reinstatement of morphine-induced CPP in rats.

Conclusion : Altogether, our findings suggest that extinction training combined with the pre-extinction atorvastatin treatment can facilitate extinction of drug-associated behavior making it an attractive therapeutic candidate in relapse prevention.

Keywords : Statin; Extinction; Reinstatement;Opioid; Conditioned Place Preference

Count: 68
Abstract ID: 677
subject: Cognition: Other
Presentation Type: Poster

"Nana or Lala" effect: The complexity of human perception and the active role of expectations

Submission Author: Gooya Bozorgi

Gooya Bozorgi[1]

1. Lecturer in IT and computer graphic design, Iran Technical & Vocational Training Organization

Background and Aim : Recent research in neuroscience shows that the entire auditory pathway represents sounds according to prior expectations (Tabas et al. 2020). This article is based on an experiment to confirm and strengthen this theory.

Methods : The core of this experiment is a recurring part ("Na Na, NaNa Na" or for short "Nana") of the classic song "Live Is Life" by Opus (Austrian band). In this experiment, about 20 people were tested. After playing the desired song, they were asked: Is that particular recurring part in the song, "La La" or "Na Na," that is being played? Almost all of them heard the "La La." Therefore, Consistent results were observed among the subjects in this experiment. Given that the folklore part "La Laee" already exists in the cultural context, They were hearing what they expected to hear.

Results : The findings show the active effect of expectations on perception, which would mean that in fact, We hear what we expect to hear. Recently some auditory illusions such as "Yanny or Laurel" and "Brainstorm/Green Needle" have been noticed.

Conclusion : The results show the sensitivity of the neural representation of the outside world to The web of belief.

Keywords : Neuroscience; Representation; Expectations; Auditory illusion; Brain.

Count: 69
Abstract ID: 200
subject: Cognition: Other
Presentation Type: Poster

Comparison of the effect of voluntary and involuntary exercise on anxiety and Serum levels of IGF-1 in the ovariectomized rats with PTSD

Submission Author: Sakineh Shafia

Sakineh Shafia[1], Majid Khanjani [2], Arvin Amiri [3], Ali Shoshtari [4], Seyed Parsa Seyedpour [5]

1. . Department of Physiology, Immunogenetics research center, Mazandaran university of Medical sciences, sari, Iran.
2. Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of veterinary medicine, Faculty of veterinary medicine, Babol Branch Islamic Azad University, babol, Iran.
4. Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
5. Department of Medical Engineering. Electrical engineering, Hadaf Institute of Higher Education, Sari, Iran

Background and Aim : Post-traumatic stress disorder (PTSD) is a psychotic disorder that occurs in people who have faced with various types of stressors. However, the efficacy of drug and psychotherapy methods, even in combination is still low and the role of exercise as an adjunctive therapy needs further study. Neurobiologically, PTSD is associated with dysregulation in several brain regions, including the amygdala, hippocampus, and prefrontal cortex. These regions are involved in emotion regulation, memory processing, and fear responses. Elevated corticosterone levels immediately after a traumatic event can enhance traumatic memory consolidation, which may contribute to the persistent and intrusive memories characteristic of PTSD. Sex hormones influence the brain's response to stress and trauma and cause sex differences in the prevalence and symptoms of PTSD. This study investigates the effects of voluntary and involuntary exercise on anxiety and serum levels of IGF-1 in ovariectomized rats with PTSD.

Methods : 56 adult female Wistar rats with an average weight of 200-250 grams were randomly selected and kept under normal laboratory conditions. First, the rats were divided into control and ovariectomy groups. Ovariectomy in rats was performed under deep anesthesia by the combination of ketamine (100 mg / kg) and xylazine (2.5 mg / kg). After surgery, meloxicam 0.5 mg/ kg was used as a subcutaneous injection for analgesia, and after a 20-days recovery period, the SPS method was used as an animal model to induce PTSD. Rats were subjected to voluntary exercise using a running wheel or forced exercise on a treadmill. Anxiety was measured using the elevated plus maze (EPM), after that the animals were killed under deep anesthesia with ketamine and xylazine and blood was taken from the heart, and serum samples were collected and frozen at -20°C until IGF-1 were measured by ELISA kit.

Results : In this study, the effects of voluntary and involuntary exercise on anxiety and serum levels of IGF-1 were investigated in ovariectomized rats suffering from PTSD. Analysis of

behavioral responses showed that in the control and ovariectomy groups, both types of exercise led to a relative increase in %OAT and %OAE, but voluntary exercise significantly decreased anxiety-related behaviors this indicated a more pronounced anti-anxiety effect of voluntary exercise than involuntary exercise and also, serum IGF-1 levels, as a hormone with neuroprotective properties, was significantly increased in Both of exercise groups. The increase in serum IGF-1 levels was greater with voluntary exercise.

Conclusion : Exercise, particularly voluntary, effectively reduces anxiety, and modulates physiological stress markers in ovariectomized rats with PTSD. These findings suggest that personalized exercise programs could be a valuable adjunct in PTSD management, promoting better mental health outcomes and overall well-being.

Keywords : Posttraumatic Stress Disorder (PTSD), exercise, Ovariectomy, IGF-1, anxiety

Count: 70
Abstract ID: 537
subject: Cognition: Other
Presentation Type: Poster

The implication of clove activated by plasma on redox imbalance and altered grooming behavior in maternal VPA-exposure

Submission Author: Maryam FaghihNeiresy

Maryam FaghihNeiresy[1], Akbar Hajizadeh Moghaddam[2], Ehsan Nazifi[3], Farshad Sohbatzadeh[4]

1. Department of Animal Sciences, Faculty of Fundamental Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran
2. Department of Animal Sciences, Faculty of Fundamental Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran
3. Department of Plant Sciences, Faculty of Fundamental Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran
4. Department of Atomic and Molecular Physics, Faculty of Fundamental Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran

Background and Aim : Autism spectrum disorder (ASD) models exhibit excessive stereotyped/repetitive behavior serving as a marker of stress like self-grooming, which is an important phenotype indicating redox imbalance. Clove is widely known for its antioxidant properties, demonstrated by its ability to scavenge free radicals. Cold atmospheric plasma (CAP) has been developed to enhance antioxidant activity and exert influential biological effects. Therefore, we conducted a study to investigate the effects of activated clove extract by plasma (ACP) on antioxidant and grooming abnormalities.

Methods : In this experimental study, pregnant rats were intraperitoneally administered valproic acid (VPA) at a dose of 500 mg/kg on the 12.5th prenatal day. The 22-day-old pups were then divided into five groups: Saline, ACP (15 mg/kg), VPA, Clove extract (CE 15 mg/kg), and ACP (15 mg/kg). All oral treatments lasted for 21 days. Additionally, 42 days after birth, a grooming test was performed to evaluate repetitive behavior. Finally, antioxidant measurements were conducted after sacrificing the animals.

Results : As depicted in the bar charts, we observed elevated GSH ($P<0.001$, $P<0.05$) and GPx ($P<0.01$) activity in the cortex and striatum, respectively, accompanied by a reduction in self-grooming behavior after ACP administration ($P<0.001$).

Conclusion : Our findings suggest that the activation of clove extract by N2-based CAP can potentially decrease repetitive behavior by strengthening the antioxidant pathway through the enhancement of plant bioactive compounds.

Keywords : Autism, Syzygium aromaticum, repetitive behavior, Cold plasma

Count: 71
Abstract ID: 281
subject: Cognition: Other
Presentation Type: Poster

Implicit transfer of foreperiod distributions in non-human primates

Submission Author: Fatemeh Mohtashami Borzadaran

Fatemeh Mohtashami Borzadaran[1], Vahid Sheibani[2], Sadegh Ghasemian[3], Farshad Alizadeh Mansouri[4], Elaheh Rohani[5], Sander Los[6]

1. Kerman Neuroscience Research Center
2. Kerman Neuroscience Research Center
3. Kerman Neuroscience Research Center
4. Monash Biomedicine Discovery Institute
5. Kerman Neuroscience Research Center
6. Institute Brain and Behavior Amsterdam (iBBA), Amsterdam, Netherlands

Background and Aim : Adaptation to environmental cues needs an implicit representation of time. Temporal preparation tasks are designed to investigate how brain anticipates an event while attention is devoted to a dimension other than time. In these tasks, prior to stimuli presentation, a warning signal is presented. The duration between a warning signal and the stimulus is foreperiod (FP). FP distributions have been shown to influence reaction times in the realm of human cognition; however, animal data, especially primate domain needs further investigation When FPs are randomly distributed, shorter reaction times are associated with longer FPs known as the variable FP effect.

Methods : We designed a choice reaction time task with two blocks for macaque monkeys. The first block consisted of exponential, uniform and antiexponential distributions of foreperiods (FPs) with 200 trials. The second block only included uniformly distributed FPs with 160 trials. The FPs were 200,400,600,800 and 1000 milliseconds. Each FP was shown according to its distribution with a different frequency. Exponential distribution FPs [200 400 600 800 1000]were distributed according to [16 8 4 2 1] frequency. Anti-exponential FPs incorporate a higher frequency of longer FPs [1 2 4 8 16]. In the uniform condition all FPs were equally distributed. The main goal was to investigate the impact of the first block's FP distribution on the second block. We conducted eight uniform-uniform sessions as the baseline, followed by eight sessions each of exponential-uniform and antiexponential-uniform distributions. Reaction time data for each block were fitted to an ex-Gaussian distribution.

Results : Our data revealed that the first block's FP distribution had an impact on the second blocks and ex-gaussian parameters were affected by the distribution of the first block.

Conclusion : The primate brain can hold an implicit representation of temporal data from the first block, which transfers to the second block. This phenomenon is known as the transfer effect.

Keywords : Temporal Preparation, Variable Foreperiod effect, Transfer effect

Count: 72
Abstract ID: 403
subject: Cognition: Other
Presentation Type: Oral

Coenzyme Q10 and Vitamin E Mitigate Heat Stress-Induced Anxiety and HPA Axis Dysregulation in Mice

Submission Author: Behzad Mansouri

Behzad Mansouri[1], Javad Mahmoudi [2], Seyed Zanyar Athari [3], Saeed Sadigh-Eteghad [4], Fereshteh Farajdokht [5]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.
4. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
5. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Heat stress can significantly impact mental health, leading to disturbances in physiological homeostasis, disruption of the hypothalamus-pituitary-adrenal (HPA) axis, and hence anxiety-like behaviors. The resultant hormonal imbalances and persistent activation of stress pathways may intensify anxiety symptoms or heighten vulnerability to neurological disorders. Research indicates that the use of suitable antioxidants can ameliorate these issues. This study investigated the effects of coenzyme Q10 (Q10) and vitamin E (Vit E) on heat stress-induced anxiety in male mice.

Methods : Animals were exposed to heat stress (43°C for 15 min/day) for 14 days, followed by treatment with Q10 (500 mg/kg), Vit E (250 mg/kg), or their combination for two weeks. Anxiety-like behaviors were assessed using the elevated plus maze (EPM) and open field tests (OFT). Serum corticosterone levels and mRNA expression of heat shock protein (hsp) 70 in the prefrontal cortex (PFC) were also assessed.

Results : Treatment groups showed increased open arm entries and time spent in open arms in the EPM, as well as increased center time and entries in the OFT. Serum corticosterone levels, a key marker of HPA axis activity, were markedly reduced in all treatment groups compared to heat-stressed controls. Additionally, hsp70 mRNA expression in the prefrontal cortex, an indicator of cellular stress response, was diminished in treated animals. Body weight measurements revealed that heat-stressed mice experienced significant weight loss, which was partially mitigated by Q10 and Vit E treatments. Core temperature monitoring showed that treated mice maintained more stable body temperatures during heat exposure compared to untreated heat-stressed animals.

Conclusion : These findings suggest that Q10 and Vit E may alleviate heat stress-induced anxiety by modulating the HPA axis and cellular stress response pathways, while also improving physiological adaptations to heat stress. This research highlights the potential of

antioxidant supplementation in managing anxiety disorders associated with chronic heat exposure.

Keywords : Heat Stress, Antioxidant, HPA, Anxiety, Mice.

Count: 73
Abstract ID: 666
subject: Cognition: Other
Presentation Type: Poster

Chamomile as a Neuroprotective Agent: Exploring Antioxidant Effects and Cognitive Enhancement

Submission Author: Mahdiyeh Safary

Mahdiyeh Safary[1], MohammadReza Zarrindast[2], Sakineh Alijanpour[3]

1. Department of Pharmacology and Toxicology, Faculty of Pharmacy and Pharmaceutical Sciences, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
2. Professor of Pharmacology, Department of Pharmacology School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Associate Professor of Biology, Department of Biology, College of Science, Gonbad kavous University, Gonbad, Iran

Conclusion : Background: Matricaria chamomilla L. and Chamaemelum nobile L. represent two medicinal varieties of chamomile belonging to the Asteraceae family. Chamomilla contains a range of chemical constituents, such as flavonoids, coumarins, volatile oils, terpenes, organic acids, and polysaccharides, among others. These compounds exhibit a variety of biological activities, including anticancer, anti-infective, anti-inflammatory, antithrombotic, antioxidant, hypolipidaemic, hypoglycaemic, antihypertensive, antidepressant, and neuroprotective effects. This review focuses on the neuroprotective properties of chamomile, particularly through its antioxidant mechanisms. Methods: A systematic review was conducted utilizing various databases, including PubMed, Medline, and Google Scholar, to identify the neuroprotective effect of chamomile through its antioxidant properties. This review focused on English articles published from 2001 to 2024. Results: Chamomile's volatile oils, polysaccharides, and flavonoids contribute to its antioxidant capabilities, enhance antioxidant enzyme activity, neutralize free radicals, and reduce oxidative stress. Chamomile is rich in α-pinene, a compound that promotes the expression of proteins and mRNA linked to cognitive function, potentially reducing depressive symptoms. Furthermore, it influences neurokinin-1 receptors and helps regulate cortisol levels, both of which play significant roles in stress and anxiety management. Matricaria chamomilla L. at the dose of 75mg/kg in rats demonstrates neuroprotective effects, particularly in mitigating memory impairment caused by scopolamine decreased. Chamomile extracts can restore brain-derived neurotrophic factor (BDNF) levels, increase IL1β, and modulate cholinergic activity in the rat hippocampus, which is vital for cognitive function. This suggests its potential as a neuropharmacological agent against amnesia. The extract of Matricaria chamomilla administered at a dosage of 500 mg/kg in rats enhances memory function impaired by formaldehyde. This improvement is achieved through a reduction in cell death within the hippocampus, a decrease in malondialdehyde activity, and an increase in overall antioxidant capacity. Apigetrin, a flavonoid found in chamomile, has been found to have inhibitory effects on neuroinflammation. It reduces the secretion and mRNA expression of inflammatory cytokines, decreases production of prostaglandin E2 and nitric oxide, and suppresses nuclear factor kappa B expression and has antioxidant effects. It also inhibits hydrogen peroxide-induced cell death in hippocampal cells, suggesting potential

prophylactic activity for neurodegenerative diseases. Additionally, apigenin can diminishes seizures and neurodegeneration associated with epilepsy when administered at a dosage of 50mg/kg OP in rats. Furthermore, the antioxidant characteristics of chamomile may prove beneficial in the management of neurological conditions such as Alzheimer's disease, Parkinson's disease, and cerebral ischemia. Matricaria chamomilla L. administered at a dosage of 2.14 ml/kg in rats orally demonstrated a significant impact on Parkinson's disease-like symptoms induced by chlorpromazine in rats, effectively reducing cataleptic behavior comparable to standard treatments. Furthermore, histological examination of the brain sections from the treated rats revealed neuroprotective properties. These findings indicate that chamomilla may possess potential anti-Parkinson's activity. Additionally, the extract exhibited vascular proliferation and an increase in the number of reactive glial cells. Conclusion: Chamomile is widely used in traditional medicine and has significant research value due to its pharmacological and neurological effects. However, more toxicity tests are needed to confirm its safety, and further research is required to validate its medicinal properties.

Keywords : Chamomilla; Neuroprotective; Antioxidant; Herbal medicine

Count: 74
Abstract ID: 542
subject: Cognition: Other
Presentation Type: Poster

Non-invasive brain stimulation effects on post-stroke cognitive impairment: A meta-analysis

Submission Author: Fatemeh Hosseinnezhad

Fatemeh Hosseinnezhad [1], Meysam Sdeghi[2], Mohammad Nasehi[3], Nasrin Hajhadian[4], Neda Darvishzade[5], Amir Hosein Mohammadi[6], Peyman Esmaeili [7], Kobra soltani khadiv[8], Fatemeh Kaka, Mohammad Hasan Choobin[9]

1. Medical Doctor, Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
2. Assistant Professor of Psychometry, Department of Cognitive Psychology, Institute for Cognitive Science Studies, Tehran, Iran
3. Full Professor, Cognitive and Neuroscience Research Center (CNRC), Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
4. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
5. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
6. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
7. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
8. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran
9. Cognitive Neuroscience PhD student, Institute for Cognitive Science Studies, Tehran, Iran

Conclusion : Introduction: Stroke is the third-leading cause of death and disability combined, about 70% of stroke survivors experience post-stroke cognitive impairment (PSCI). Non-invasive brain stimulation (NIBS) is a promising method for preserving cognitive function after stroke. The ranking of various NIBS modalities, stimulation sites and length, has yet to be properly assessed. This meta-analysis attempts to compare the impact of NIBS mods including Repeated transcranial magnetic stimulation (rTMS) and Transcranial direct current stimulation (tCDS), on post-stroke cognitive function improvement. Methods: A non-systematic review of randomized control trials (RCT) was conducted in three electronic databases, including Medline, Scopus, and Psycinfo. 170 literatures published from January 2018 to August 2024, were reviewed. The risk of bias in the included reports was assessed using the Cochrane Risk Assessment tool for RCTs (ROB2). Global cognition severity was quantified using the Mini-Mental State Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) scales. A standard meta-analysis was performed to compare NIBS modalities effects on cognitive function improvement in post- stroke patients. Data for each outcome indicator were analyzed using the Comprehensive Meta-Analysis software (CMA V.3.3) Result: A total of 14 studies involving 632 participants were included, the overall effect size of non-invasive brain stimulation (NIBS) in PSCI patients was 0.74 in the fixed effects model and 0.73 in the random effects model, Witch demonstrate a practical significance. In comparing two non-invasive brain stimulations, rTMS had the largest effect size (standardized mean difference [SMD] = 0.89, 95% confidence interval (CI) 0.64–1.14, P <0.05), followed by tDCS effects ([SMD]= 0.73, 95% (CI) 0.35–1.12, P <0.05). Meta-analysis shows that NIBS mods significantly improved

MoCA scores ([SMD] = 0.80, 95% (CI) 0.56–1.04, P <0.05), and so MMSE scores ([SMD] = 0.66, 95% (CI) 0.26–1.07, P < 0.05). In terms of stimulation targets, the Dorsolateral prefrontal cortex (DLPFC) scored more points in global cognition severity. Conclusion: The Present evidences indicate that both rTMS and tDCS improves cognitive impairment. Furthermore, the rTMS emerges as the most promising intervention for enhancing cognitive function. In conclusion, NIBS could be considered as a recommended approach to improve global cognitive function in PSCI patients.

Keywords : Post-stroke cognitive impairment; Non-invasive brain stimulation; Repeated transcranial magnetic stimulation; Transcranial direct current stimulation; Randomized control trial; Meta-analysis

Count: 75
Abstract ID: 35
subject: Cognition: Other
Presentation Type: Poster

"Harnessing Brain Plasticity: The Transformative Role of Physical Activity in Cognitive Health"

Submission Author: Shima Karimiafshar

Shima Karimiafshar[1]

1. Cognitive Sciences Research Institute, ShahidBeheshti University of Tehran

Conclusion : Abstract This article examines the brain's plasticity and the impact of various physical activities on it. Brain plasticity encompasses structural and functional changes at macro, cellular, and molecular levels, influenced by learning, exercise, and environmental factors. Aerobic, resistance, and balance exercises specifically contribute to the enhancement of brain structure and function. The findings indicate that aerobic exercises can increase gray matter volume and cognitive performance in older adults, while resistance training aids in improving executive function and reducing white matter atrophy. Additionally, balance exercises are associated with increased brain plasticity and enhanced cognitive abilities in the elderly. Ultimately, the mechanisms underlying these changes include increased production of growth factors and neurotransmitters, which support neurogenesis and synaptic plasticity. These findings underscore the importance of physical activity in maintaining and improving brain health.

Keywords : Brain plasticity, aerobic exercises, resistance training, cognitive performance, neurogenesis, brain plasticity.

Count: 76
Abstract ID: 733
subject: Cognition: Other
Presentation Type: Oral

Effectiveness of attention bias modification in reducing impulsive behaviors and substance craving

Submission Author: Mania Asgharpour

Mania Asgharpour[1], Nasrin Hosseini[2]

1. karaj Azad university Psychology department,tehran, Iran.
2. Neuroscience Research Center, Iran university of Medical sciences, Tehran, Iran

Conclusion : Attention, as the most fundamental cognitive ability, guiding all perceptual processes and also modulating emotion regulation and behaviors. In this regard, the ability to intervene and shift the focus of attention ,plays a crucial role in the treatment of various substance abuse disorders ,destructive habits, bulimia and impulsive control disorders Reconstructing selective attention toward neutrals stimulus instead of automatic attention towards addictive stimuli, reduces the activation of brain reward circuits and increase the stimulus threshold activity in ventral tegmentum area.1 Therefore, changing the attention bias and focus of an addicted individual's attention is an effective step in decreasing the recurrence of craving and impulsive behaviors. Treatments and studies conducted using Attention Bias Modification (ABM) techniques are based on this principle. Most research in the area of ABM has utilized techniques such as Dot Probe, Visual Probe, Stroop, Flicker, Dual Task, and Eye Tracking.2 In most studies, participants are presented with images of various stimuli with emotional or neutral content, as well as images specifically related to substance abuse. The amount, intensity, focus, and direction of the patients' attention are then evaluated. Studies indicate that the degree of attention bias can be a predictive factor for determining consumption tendencies and the likelihood of relapse after treatment.2 In the presence of triggering stimuli, reward circuits are primarily activated, while the inhibitory firing capacity of the prefrontal cortex decreases, which is one of the fundamental reasons for the repetition of addictive behaviors and destructive habits. The ability of enhancing goal-directed attention towards neutral stimuli is recommended in cognitive behavior therapy for reducing the activity of the pleasure and reward systems for treatment of impulsive control behaviors. Among review studies, the results of one research indicated that out of eighteen studies conducted using the ABM technique, ten reported significant changes in patients' cravings and addicted symptoms 3. The brain automatically focuses towards stimuli that offer rewards and avoid suffering, and substance abusers individuals are drawn to stimuli that remind them of pleasure, perceiving and concentrating on these cues more rapidly. This factor is one of the fundamental obstacles encountered in the treatment process of substance abuse. However, the brain has a flexible structure, and if we can purposefully readjust the intensity and direction of attention to create new pathway in conscious attention circuits, we may have taken a significant step towards reducing symptoms related to substance abuse and impulsive behaviors. In this context, providing software designed based on the ABM technique can reduce the need for patients to go and visit substance abuse treatment centers and can serve as a smart cognitive rehabilitation

tool for outpatients. Nonetheless, long-term research is recommended to fallow up the sustainability and intensity of the effectiveness of this therapeutic technique.

Keywords : ATTENTION, CRAVING, IMPULSIVITY

Count: 77
Abstract ID: 691
subject: Cognition: Other
Presentation Type: Poster

Investigating self-motivation in drug addicts with and without tDCS treatment and healthy subjects

Submission Author: Soghra AkbariChermahini

Soghra AkbariChermahini[1], Mersad Khalaji[2]

1. Associate Prof, Department of Psychology, Faculty of human sciences, Arak University, Arak, Iran
2. Master of General Psychology

Background and Aim : Self-motivation is a concept refers to a person's ability to create and maintain motivation to change behaviors and achieve goals. In the context of addiction, self-motivation can have a huge impact on the success or failure of drug withdrawal. Today, the prevalence of drug use has led researchers to investigate the various dimensions of harm and its consequences. Psychological factors related to drug abuse are of great importance. One of the important variables in this field is self-motivation. In this context, the use of research has shown that the use of neuromodulation techniques such as direct brain current stimulation (tDCS) can have positive effects on improving psychological functions. This study examines the effect of tDCS on self-motivation deficits in drug addicts.

Methods : This research was a quasi-experimental study with experimental and control groups. Its statistical population included those who referred to one of the addiction treatment centers located in the north of Tehran. A group of 15 individuals voluntarily participated in this research (5 with and 5 without tDCS, and 5 healthy subjects). All 3 groups responded to Barkley deficits in executive functioning scale (BDEFS for Adults). The tDCS applied over the dorsolateral prefrontal cortex (DLPFC) (anodal stimulation of F3 region, and cathodal stimulation of F4 region with a current start of 2 mA) for 5 weeks and 3 sessions every week, only the experimental group received this

Results : The results of multivariate analysis of variance (MANOVA) showed significant differences between 3 groups in Self-Motivation, healthy subjects revealed better performance than two other groups, and the group with tDCS was significantly better than the group without tDCS ($p<0.5$).

Conclusion : It could be said that tDCS has an effect on improving the psychological aspect of daily life in substance abusers.

Keywords : Substance Abuse, tDCS, self-motivation

Count: 78
Abstract ID: 220
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Oral

Mitotherapy restores hippocampal mitochondrial function and cognitive impairment in aged male rats subjected to chronic mild stress

Submission Author: Gonja Javani

Gonja Javani[1], Shirin Babri[2], Fereshteh Farajdokht[3], Arshad Ghaffari-Nasab[4], Gisou Mohaddes [5]

1. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
2. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
4. Faculty of Medicine, Maragheh University of Medical Sciences, Maragheh, Iran
5. Department of Biomedical Education, California Health Sciences University, College of Osteopathic Medicine, Clovis, CA, USA

Background and Aim : his study aimed to determine the effects of mitotherapy on learning and memory and hippocampal kynurenine (Kyn) pathway, mitochondria function, and dendritic arborization and spine density in aged rats subjected to chronic mild stress.
Methods : Twenty-eight male Wistar rats (22 months old(were randomly divided into Aged, Aged + Mit, Aged + Stress, and Aged + Stress + Mit groups. Aged rats in the stress groups were subjected to different stressors for 28 days. The Aged + Mit and Aged + stress + Mit groups were treated with intracerebroventricular injection (10 µl) of fresh mitochondria harvested from the young rats' brains, and other groups received 10 µl mitochondria storage buffer. Spatial and episodic-like memories were assessed via the Barnes maze and novel object recognition tests. Indoleamine 2,3-dioxygenase (IDO) expression and activity, Kyn, Tryptophan (TRY), ATP levels, and mitochondrial membrane potential (MMP) were measured in the hippocampus region. Golgi-Cox staining was also performed to assess the dendritic branching pattern and dendritic spines in the hippocampal CA1 subfield.
Results : The results showed that mitotherapy markedly improved both spatial and episodic memories in the Aged + Stress + Mit group compared to the Aged + Stress. Moreover, mitotherapy decreased IDO protein expression and activity and Kyn levels, while it increased ATP levels and improved MMP in the hippocampus of the Aged + Stress + Mit group. Besides, mitotherapy restored dendritic atrophy and loss of spine density in the hippocampal neurons of the stress-exposed aged rats.
Conclusion : These findings provide evidence for the therapeutic effect of mitotherapy against stress-induced cognitive deterioration in aged rats by improving hippocampal mitochondrial function and modulation of the Kyn pathway.
Keywords : Aging; memory; Mitotherapy; Indoleamine 2, 3-Dioxygenase; Kynurenine pathway

Count: 79
Abstract ID: 34
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

Neural Mechanisms Underlying Stress Resilience: A Review

Submission Author: Shima Karimiafshar

Shima Karimiafshar[1], Leila Farahbakhsh[2]

1. Cognitive Sciences Research Institute, ShahidBeheshti University of Tehran
2. Faculty of Humanities, Department of Psychology, Islamic Azad University, Sirjan Branch

Conclusion : Depression is one of the most prevalent mental disorders, and its incidence is continuously rising. In Iran, the lifetime prevalence of depression is estimated to be around 15% to 18%, meaning that approximately one in five individuals will experience a depressive episode during their lifetime. Stress, as an environmental factor, is a major contributing cause of depression. Individuals who have experienced stress but are not afflicted by depression exhibit resilience to stress. Investigating the neural mechanisms underlying resilience to stress is crucial for the prevention and treatment of depression in clinical settings. This paper reviews recent research advancements in the neural mechanisms of stress resilience. It begins by introducing the Chronic Social Stress (CSDS) model, commonly utilized in resilience research. Subsequently, it focuses on research advancements related to brain regions associated with resilience at the molecular, cellular, and circuit levels. Furthermore, studies concerning clinical mechanisms before resilience treatment and their translation into clinical applications are presented. Finally, the paper discusses future directions and perspectives for research on resilience to stress.

Keywords : Depression, Stress, Resilience, Neural mechanisms, Chronic Social Stress (CSDS), Clinical applications

Count: 80
Abstract ID: 100
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

Investigating the mediating role of information processing speed in the structural relationships of metacognitive beliefs with inconsistency in students with specific learning disabilities.

Submission Author: Akram Azarnia

Akram Azarnia[1]

1. PhD in Psychology , Razi University, kermanshah, iran

Background and Aim : Students with special learning disabilities, despite having natural intelligence, proper education and not having biological defects such as visual and hearing defects, show weaker performance in certain areas (mathematics, reading and writing) than other students of the same grade. The weakness of metacognitive awareness can cause learning problems in students, because it makes them unable to use appropriate strategies; In fact, these students are passive learners who do not have a suitable strategy to deal with learning problems due to their weakness in metacognitive ability. The speed of information processing affects thinking, listening, speaking and how people react in emotional situations and social interactions and can adapt a person to challenges. In this research, the mediating role of information processing speed in the structural relationships of metacognitive beliefs with inconsistency in students with special characteristics has been investigated

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

Results : The findings showed that metacognitive beliefs have a direct and significant effect on inconsistency ($P<0.05$). Metacognitive beliefs have an indirect and significant positive effect on the incompatibility of students with disabilities due to the speed of information processing ($P<0.05$).

Conclusion : The results of data analysis showed that metacognitive beliefs, as a psychological construct, decide on managerial roles and executive management and help learners to participate actively instead of being passive. Teachers create metacognitive dialogues that foster self-evaluation and self-management skills in students, and further increase self-evaluation, self-management, and "skill and will." All these factors make the cognitive

functions such as the speed of information processing in this group of students to improve and increase their adaptability.

Keywords : metacognitive beliefs, information processing speed, adaptation, specific learning disorder

Count: 81
Abstract ID: 101
subject: Emotion, Motivation and Behavior: Neural Basis of Human Behavior
Presentation Type: Poster

The effectiveness of virtual reality-based mindfulness training on improving the cognitive regulation of emotion in students with special learning disabilities

Submission Author: Akram Azarnia

Akram Azarnia[1]

1. PhD in Psychology , Razi University, kermanshah, iran

Background and Aim : Specific learning disorder in children is a neurodevelopmental disorder that affects the ability of the brain to receive and process information through the interaction of environmental and hereditary factors. Despite having normal intelligence and due to the lack of biological defects in academic fields (reading, writing and arithmetic), these children have weaker academic performance. Compared to their peers, these students have a lower emotional regulation ability and perform poorly in using cognitive strategies, so these children use more negative strategies to regulate their emotions; A defect in the cognitive regulation of emotions causes problems in various functions of a person's life and makes a person vulnerable to the anxiety and stress of everyday life and emotionally affects the level of a person's performance. The present study was conducted with the aim of investigating the effectiveness of mindfulness training based on virtual reality on improving the cognitive regulation of emotions in students with special learning disorders.
Methods : The research method was semi-experimental with a pre-test, post-test and a two-month follow-up. The statistical population was female students with learning disabilities who referred to learning disability centers in the academic year 1401-1402 in Kermanshah city. Garnefski's (2006) Cognitive Emotion Regulation Questionnaire was administered to the students, and among those who met the criteria for entering the research, 24 students were selected by purposive sampling and randomly placed in two groups of 12 people, experimental and control. The experimental group received 10 sessions of mindfulness training based on virtual reality, but the control group did not receive training. One week after the last training session, the post-test and two months later, the follow-up test was done.
Results : The data were analyzed using repeated measures analysis of variance. The results showed that mindfulness training improves the cognitive regulation of emotion in these students ($P<0.001$) and these effects were stable in the follow-up phase.
Conclusion : Since mindfulness training based on virtual reality improves people's cognitive-emotional regulation skills, it can moderate the emotions that a person experiences in different situations by increasing attention and awareness. Therefore, this efficient method can be used to improve the level of cognitive emotion regulation of these students.
Keywords : Specific learning disorder, mindfulness, virtual reality, Cognitive regulation of emotion

Count: 82
Abstract ID: 409
subject: Emotion, Motivation and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Basic and clinical views of association between the brain reward system and sleep: A narrative review

Submission Author: Sayedeh-Fatemeh Sadat-Madani

Sayedeh-Fatemeh Sadat-Madani[1]

1. Medical Doctor, Isfahan Student Research Committee School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Conclusion : The association between the brain reward system and sleep reveals crucial insights into how sleep influences reward processing and memory consolidation. Disruptions in this relationship, particularly through sleep disturbances, can significantly impact decision-making and cognitive health, contributing to various clinical disorders. Understanding these neurophysiological mechanisms could open new avenues for therapeutic interventions targeting the reward system and sleep regulation to treat related disorders effectively.

Keywords : Brain reward system, sleep, mesolimbic dopaminergic pathway, neuromodulators, sleep disorders, reward-related memory, decision-making.

Count: 83
Abstract ID: 569
subject: Emotion, Motivation and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

The effect of blue light blocking glasses on circadian rhythm and progression of dry eye

Submission Author: Saba Rahmati

Saba Rahmati[1], behzad garmabi[2]

1. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
2. Department of Neuroscience, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Conclusion : Objective: Dry eye is a condition that can negatively affect the quality of life. Symptoms of dry eye include dryness, blurred vision, and pain. An unhealthy lifestyle, particularly sleep disturbances, is considered a risk factor for this condition. The circadian rhythm is an internal process influenced by environmental factors such as light, temperature, and others. This rhythm ensures the optimal functioning of essential bodily processes. Blue light exposure during the day is beneficial for regulating the circadian rhythm, alertness, and cognitive performance. Blue light, with a wavelength between 390-470 nm, has high energy and, when encountered at inappropriate times, can lead to retinal damage, dry eyes, and many other problems. Artificial light, which contains blue light wavelengths, stimulates the brain, suppresses melatonin secretion, disrupts hormonal balance, and interferes with the circadian rhythm, leading to reduced sleep quality and the progression of dry eye. Thus, maintaining a balanced circadian rhythm is crucial. Electronic devices are among the strongest sources of blue light emissions, and since their use is widespread in today's world, eliminating these blue light-emitting devices is not feasible. Therefore, utilizing appropriate solutions to block blue light from entering the eyes is essential to address this issue. Method: This review article was compiled by studying various texts and articles through electronic searches in databases such as PubMed, ScienceDirect, Google Scholar, Scopus, and SID. Based on keywords, 11 articles were suitable for the final analysis. Findings: The study's findings indicated that while blue light has beneficial effects during the day, at night—especially before bedtime—it can cause retinal damage, lead to various eye diseases, and increase reactive oxygen species (ROS) production. Additionally, by affecting intrinsically photosensitive retinal ganglion cells (ipRGCs) and the retinohypothalamic pathway, blue light influences melanopsin expression, suppresses melatonin, and impacts sleep quality. Through its effect on sleep quality, it also contributes to the progression of dry eye across different age groups. Filtering blue light helps reduce blurred vision, enhances visual clarity in dry eye patients, regulates the circadian rhythm, and improves sleep quality. Conclusion: According to our study, using blue light-blocking glasses, due to their non-invasive nature, ease of use, and their ability to reduce blue light exposure from electronic devices at night, has positive effects on circadian rhythm regulation and sleep quality, as well as reducing the unpleasant symptoms of dry eye.

Keywords : blue light; circadian rhythm; dry eye; sleep quality; blue light-blocking glasses

Count: 84
Abstract ID: 199
subject: Emotion, Motivation and Behavior: Biological Rhythm and Sleep
Presentation Type: Poster

Exploring the Impact of Sleep Inertia Following Night Sleep on Acoustic and Perceptual Voice Quality Parameters

Submission Author: Mohammad-Amin Nazari

Mohammad-Amin Nazari[1], Kowsar Baghban[2], Mohammad-Sadegh Seifpanahi[3], Leili Tapak[4]

1. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Hamadan University of Medical Sciences, Hamadan, Iran
3. Department of Speech and Language Pathology, Autism Spectrum Disorders Research Center, School of Rehabilitation Sciences, Hamadan University of Medical Sciences, Hamadan, Iran
4. Department of Biostatics, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Sleep inertia refers to a state of diminished alertness and cognitive function immediately after waking. While its effects on cognitive and motor skills have been extensively studied, its influence on vocal quality remains unclear. This research aims to investigate how sleep inertia affects acoustic and perceptual voice parameters in adults.

Methods : A total of ninety healthy individuals, comprised of 45 females and 45 males aged between 18 and 30 years, participated in this pre-post study using convenience sampling. Their vocal performances were recorded both prior to and following a night of sleep, engaging in a variety of tasks such as phonating the vowel sound /a/, spontaneous dialogue, reading a standard text, and measuring maximum phonation time (MPT). Recordings took place in a soundproof room with a Zoom H6 audio recorder set to a sampling rate of 44.1 kHz. The acoustic assessment included evaluations of fundamental frequency (F0), standard deviation of F0 (SD F0), sound intensity, harmonic-to-noise ratio (HNR), smoothed cepstral peak prominence (CPPS), jitter, shimmer, and formant frequencies. For auditory-perceptual analysis, the GRBAS scale was utilized.

Results : Acoustic evaluations indicated that both male and female participants exhibited reductions in mean fundamental frequency (F0), mean intensity, harmonic-to-noise ratio (HNR), and smoothed cepstral peak prominence (CPPS), along with increases in jitter, shimmer, and standard deviation of F0 across the majority of voice samples following sleep. Notably, these alterations were especially pronounced in females across all voice samples ($P < 0.001$). Furthermore, perceptual assessments revealed a significant rise in the parameters of grade, roughness, breathiness, asthenia, and strain for both sexes after sleeping ($P < 0.001$).

Conclusion : This study highlighted that sleep inertia adversely affects vocal performance, leading to a deterioration in voice quality for both men and women following sleep when

compared to pre-sleep levels. Importantly, this decline in vocal quality was found to be more significant in women than in men.

Keywords : Sleep inertia; night sleep; voice quality; acoustic analysis; auditory-perceptual evaluation

Count: 85
Abstract ID: 188
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Investigating the effect of magic mushroom (Psilocybe Azurescens) on anxiety and depression in male Wistar rats

Submission Author: Hediye Moghadam

Hediye Moghadam[1], Elmira beirami[2], Neda valian[3], Samaneh nabavi fard[4]

1. Kharazmi University, Tehran, Iran
2. Kharazmi University, Tehran, Iran
3. Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Psilocybin mushrooms, popularly known as magic mushrooms, are a multi-family group of umbrella mushrooms that contain the hallucinogenic substance psilocybin. When consumed by humans, psilocybin is converted to psilocin, which has psychoactive properties. Since the use of magic mushroom as an addictive drug has recently attracted the attention of young people, especially at a young age, and has quickly become a social challenge, therefore, the aim of this study was to investigate the effects of magic mushroom on anxiety and depression in Male Wistar rats.

Methods : the rats were divided into 4groups: control (treatment with normal saline), 10, 100, and 250mg/kg doses of magic mushroom. Different doses of magic mushroom were injected by gavage for two weeks (every other day). Forced swim test (FST) and elevated plus maze test (EPM) were used to evaluate depression and anxiety, respectively.

Results : The results of the FST test showed that the climbing time in rats treated with a dose of 250mg/kg of mushroom was less than the control group and their immobility increased. The results of the EPM test also showed that the rats treated with a dose of 250mg/kg mushroom spent more time in the closed arms than the control group, and the number of entries into the closed arms was also higher in them.

Conclusion : In general, this study showed that the long-term use of high-dose magic mushroom increases depression and anxiety in rats. Examining the molecular mechanisms involved in depression and anxiety is proposed as the suggestions of this study.

Keywords : Magic mushroom; Depression; Anxiety; Rat

Count: 86
Abstract ID: 127
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Anxiety Correlates with BDNF Protein Alterations in a Salicylate-induced Tinnitus Model

Submission Author: Zeinab Akbarnejad

Zeinab Akbarnejad[1]

1. ENT and Head and Neck Research Center and Department, The Five Senses Health Institute, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Given the high prevalence of tinnitus and its association with anxiety, it is important to understand the underlying mechanisms. Brain-derived neurotrophic factor (BDNF) affects several neurotransmitter systems and intracellular signaling, suggesting that anxiety may result from chemical imbalances in the brain. This study investigates whether changes in BDNF protein expression in the amygdala of tinnitus-affected animals contribute to increased anxiety in tinnitus patients.

Methods : Twelve male Wistar rats were divided into two experimental groups: control and sodium salicylate. The gap-pre-pulse inhibition of acoustic startle (GPIAS) and pre-pulse inhibition (PPI) tests were performed to assess tinnitus and hearing. Sodium salicylate was then administered to induce tinnitus. After confirmation of tinnitus, the Elevated Plus Maze (EPM) and Open Field Test (OFT) were used to assess anxiety levels in both groups. Finally, BDNF protein expression was evaluated by Western blotting.

Results : The results showed that the tinnitus group had higher anxiety levels than the control group in both behavioral tests: the time spent in closed arms and open arms in EPM ($p<0.01$) and the time spent in the center and the border in OFT ($p<0.05$). In addition, the expression of BDNF proteins in the amygdala of the tinnitus group was significantly higher than that of the control group ($p<0.05$).

Conclusion : These results suggest that the elevated BDNF protein levels in the amygdala nucleus contribute to anxiety in tinnitus. Therefore, these proteins may be potential therapeutic targets for tinnitus.

Keywords : Anxiety, Brain-derived neurotrophic factor, Tinnitus

Count: 87
Abstract ID: 77
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Effects of escitalopram on anxiety-like behaviors in male rats under chronic mild predictable and unpredictable stress

Submission Author: Vajihe Saedimarghmaleki

Vajihe Saedimarghmaleki[1], Maryam Radahmadi [2], Hojjatallah Alaei [3], Hossein Khanahmad[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. Department of Genetics and Molecular Biology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Exposure to chronic stress is known to cause adverse behavior. Furthermore, the impact of escitalopram on anxiety-like behaviors is a topic of ongoing debate. This study aimed to investigate the effects of prolonged escitalopram administration on anxiety-like behaviors in rats under predictable and unpredictable chronic mild stress (PCMS and UCMS, respectively).

Methods : 49 male rats were randomly assigned to different groups of control (Co), sham (Sh), PCMS and UCMS (P.St and UP.St, respectively; 2 h/day, for 21consecutive days), escitalopram (Esc; 10mg/kg, i.p., for 21days), as well as PCMS and UCMS with escitalopram (P.St-Esc and UP.St-Esc, respectively). The study evaluated the number of open arm entries (OAE%) and open arms time spent (OAT %) by the elevated plus maze (EPM) test.

Results : The OAT% and OAE% significantly decreased in the P.St and UP.St groups. In addition, these parameters showed significant enhancements in the P.St-Esc group compared to the P.St group. Only the OAT% showed significant enhancements in the UP.St-Esc group compared to the UP.St group.

Conclusion : Exposure to both predictable and unpredictable chronic mild stress (PCMS and UCMS, respectively) can induce to anxiety in rats. Additionally, the escitalopram administration (at a dosage of 10 mg/kg) strongly improved anxiety-like behaviors in rats that were subjected to the PCMS. This suggests that escitalopram may differently impact anxiety-like behaviors in the PCMS and UCMS conditions through various signaling pathways in the brain. It is better that different dose of escitalopram is administrated in PCMS and UCMS conditions for improvement of anxiety-like behavior.

Keywords : Escitalopram; anxiety-like behaviors; Predictable stress; Unpredictable stress

Count: 88
Abstract ID: 516
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

Investigating the effect of trigonelline on inflammation , depressive and anxiety behaviors induced by reserpine injection in male rats

Submission Author: Donya Nazarinia

Donya Nazarinia[1], Reza Rezvanzadeh [2], somayeh vazifehkhah[3]

1. Department of Physiology, School of Medicine, Dezful University of Medical Sciences, Dezful, Iran
2. Student Research Committee, Dezful University of Medical Sciences, Dezful, Iran
3. Department of Basic Sciences, Faculty of Medicine, Sari Branch, Islamic Azad University, Sari, Iran

Background and Aim : Anxiety and depression are often co-occurring psychiatric disorders that are chronic and tend to recur. They are linked to biochemical, cognitive, behavioral, and psychological alterations, which can lead to a substantial socioeconomic impact. Findings have shown inhibition of inflammation may offer new approaches to the treatment of depression and anxiety. Recently, several studies have suggested that trigonelline (TRG) has antioxidant effects. However, there is no Sufficient evidence of its effectiveness against Anxiety and depression. Here, we evaluated its neuroprotective effects at different doses (50 and 100 mg/kg) against reserpine(RES)-induced model of depression

Methods : Thirty male Wistar rats were randomly divided into five groups: control, RES 1.5mg/kg, TRG50 + RES, TRG100 + RES and Fluoxetine(FLU) + RES. In order to establish depression model, 1.5mg/kg of RES was injected intraperitoneally for 10 consecutive days. We have analyzed the effects of TRG treatment on immobility behavior (forced swimming test)and assess anxiety-like behavior(Elevated-plus maze).We used ELISA technique to measure the expression of the pro-inflammatory cytokines hippocampal

Results : : Our findings showed that Reserpine induced a significant increase in the immobility time of rats in the forced swimming test, anxiety-like behavior, higher levels of TNF-α. treatment with TRG (100 mg/kg) ameliorated the reserpine induced changes.

Conclusion : Collectively, outcome of this work shows that TRG has the ability to prevent depression induced by reserpine probably via its antioxidant activity.

Keywords : inflammation, male Wistar rats, reserpine, depression

Count: 89
Abstract ID: 218
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

Prolonged stress-induced depression-like behaviors in aged rats are mediated by endoplasmic reticulum stress and apoptosis in the hippocampus

Submission Author: Arshad Ghaffari-Nasab

Arshad Ghaffari-Nasab[1], Gonja Javani[2], Hadi Yousefi [3], Rahim Sharafkhani[4], Sajjad Taghizadeh[5]

1. Faculty of Medicine, Maragheh University of Medical Sciences, Maragheh, Iran
2. Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Basic Medical Sciences, Khoy University of Medical Sciences, Khoy, Iran
4. School of Health, Khoy University of Medical Sciences, Khoy, Iran
5. Department of Physiology, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Structural and functional recovery from stress-induced depression is impaired in the context of aging brain. Since investigating the molecular substrates that facilitate behavioral recovery may have important implications for understanding brain plasticity and resilience of individuals, we studied depressive-like behaviors in young and aged rats 6 weeks after chronic stress exposure as a recovery period and examined the levels of TNF-α and IL-6 inflammatory cytokines, NADH oxidase activity, NADPH oxidase, endoplasmic reticulum (ER) stress markers, and apoptosis in the hippocampus.

Methods : Young (3 months old) and aged (22 months old) male Wistar rats were divided into four groups; young control (Young), depression model of young rats that received chronic stress procedure followed by a 6-week recovery period (Young+S), aged control (Aged), and depression model of aged rats that received chronic stress procedure followed by a 6-week recovery period (Aged+S).

Results : After the recovery period, aged but not young rats showed depression-like behaviors, evaluated by the sucrose preference test (SPT) and forced swimming test (FST), coincided with the altered levels of TNF-α, IL-6, NADH oxidase activity, NADPH oxidase, GRP78, CHOP, and cleaved caspase-12 in the hippocampus of these animals.

Conclusion : These data suggested that oxidative and ER stress-induced apoptosis in the aging hippocampus may affect the recovery-related outcomes after the stress paradigm.

Keywords : Aging, Depression, Recovery, Endoplasmic reticulum stress, Apoptosis

Count: 90
Abstract ID: 66
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Oral

The effect of chronic stress during pregnancy on oxidative stress in the hippocampus following memory impairment due to global ischemia in adult male offspring in rat

Submission Author: Hossein Zarei

Hossein Zarei[1], Dr. Farzaneh Vafaee[2]

1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Exposure to stressors can alter brain function, leading to behavioral changes during generations. Fetus's developing brain is more susceptive to stressors. Stress can arouse oxidative stress and cellular damage in the brain. Pregnancy chronic immobility stress (pCIS) is an important kind of stress, causing some brain malfunction in offspring. Global cerebral ischemia (GCI) is defined by the downfall of brain blood flow by less than 15 percent of the average. It causes memory impairment by inducing oxidative cellular damage due to hypoxia in the hippocampus, the most hypoxia-sensitive region, and the main memory consolidation site. Reactive oxygen species destroy cellular membranes and leave secondary tissue injuries. This study aims to evaluate the potential effects of pCIS on oxidative stress and reinforcement in the hippocampus following memory impairment due to GCI.

Methods : Twenty Wistar gravid female rats were scattered in 4 even groups as follows. Control: no-pCIS and no-GCI induction; Ischemia: no-pCIS and GCI induction; stress: pCIS and no-GCI induction and stress/ischemia: pCIS and GCI induction. The pCIS was applied for 10 days in the last 10 days of pregnancy. Ten male offspring of each group were dissociated from dams 21 days after birth and grouped in matters of first categorization. Offspring were housed in a standard situation till maturation for further tests (4 months aged or 180-220 g weight). As the accomplishment of pCIS, the anxiety-like behavior manifestation as a major effect of pCIS-induction was evaluated by the Elevated Plus Maze (EPM) test in pCIS-induced groups. GCI was induced by the two-vessel occlusion method surgery. All groups experienced the surgery, but GCI was induced only in the ischemia and stress/ischemia groups. Animals were assessed by Neurological Deficit Score, Wire Hanging, Morris Water Maze (MWM), and Shuttle Box (ShB) in the next 21 days. Then offspring were sacrificed; hippocampus tissue was sampled for Malondialdehyde, total Thiol oxidative stress test.

Results : The study's results demonstrate that MWM and ShB tests showed a significant tendency to exacerbate memory impairment in the stress/ischemia group versus the ischemia and stress groups. pCIS caused more hyper-accumulation oxidant agents versus antioxidant

agents in the hippocampus in the stress/ischemia group versus the stress and ischemia group. All study groups had more oxidant activity than the control group.

Conclusion : The results emphasized the long-lasting effect of pCIS in the hippocampus and the reinforcing effect on memory impairment after GCI. It seems this effect can be due to the increase of oxidative stress activity which requires further studies focused on possible underlying cellular and molecular mechanisms of this long-lasting effect.

Keywords : Pregnancy stress; oxidative stress; memory impairment; hippocampus; global cerebral ischemia

Count: 91
Abstract ID: 656
subject: Emotion, Motivation and Behavior: Stress and the Brain (Stress-modulated Pathways, Stress and Cognition, Stress Related Disorders)
Presentation Type: Poster

Comparative Effects of Visible Light Wavelengths on depressive-like behavior and Oxidative Stress in a Chronic Stress-Induced Rat Model

Submission Author: Fatemeh RahmatiDehkordi

Fatemeh RahmatiDehkordi[1], Ashkan Sanaeierad[2], Elham Zahedi[3]

1. Electrophysiology Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran; Department of Physiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.
3. Electrophysiology Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran; Department of Physiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

Background and Aim : Chronic stress is known to cause significant cognitive impairments, worsened by oxidative stress and neuronal damage in brain regions such as the hippocampus and prefrontal cortex. This study explores the potential therapeutic effects of various visible light wavelengths (red, green, and blue) on cognitive dysfunction and oxidative stress in a rat model of chronic unpredictable mild stress (CUMS).

Methods : Fifty male Wistar rats were divided into control, CUMS, and light-exposure groups. The light-exposed groups received daily exposure to red (650 nm, 1300 lux), green (530 nm, 1300 lux), or blue (460 nm, 1300 lux) light for four hours over four weeks. Behavioral tests, including the Elevated Plus Maze, Splash Test, and Tail Suspension Test, were conducted to evaluate anxiety, grooming behavior, and depression-like behaviors. Oxidative stress markers, including catalase activity and malondialdehyde (MDA) levels, were measured through biochemical analyses.

Results : Results indicated that chronic stress impaired cognitive function and increased oxidative stress. While red light exposure showed no significant effects, blue light exposure reduced MDA levels and enhanced catalase activity, leading to improved depressive-like behaviors in treated groups.

Conclusion : These results suggest that visible light exposure, particularly blue light, may offer a promising non-invasive treatment for stress-induced cognitive impairments by reducing oxidative stress and neuronal damage.

Keywords : Light wavelengths, Chronic stress, CUMS, Cognitive function, Oxidative stress

Count: 92
Abstract ID: 208
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

Role of GABAB receptors in the retrieval of methamphetamine reward memory in REM sleep-deprived rats

Submission Author: Mehdi Khodamoradi

Mehdi Khodamoradi[1], Christian P. Müller[2], Nasrin Abdoli[3]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.
2. Department of Psychiatry and Psychotherapy, University Clinic, Friedrich-Alexander-University of Erlangen-Nürnberg, Schwabachanlage 6, 91054, Erlangen, Germany.
3. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background and Aim : GABAB receptors play a modulatory role in the mechanisms underlying drug addiction, sleep problems, and aging; however, there are few studies addressing their relationship. Therefore, this study aimed to examine whether blockade of these receptors affects methamphetamine (METH) reward memory in adult and adolescent rapid-eye movement sleep deprived (RSD) rats.

Methods : Adolescent and adult male Wistar rats were subjected to RSD for seven days. They were then conditioned to receive methamphetamine (METH; 2 mg/kg, ip) during an eight-day conditioning period. METH reward memory was then reactivated during a retrieval trial and the GABAB receptor agonist baclofen (2.5 or 5 mg/kg, ip) was injected prior to the retrieval trial. Afterward, animals were retested for the expression of conditioned place preference (CPP) and hippocampal expression of GABAB receptors.

Results : Baclofen dose-dependently decreased the retrieval of METH reward memory in control and RSD adult and adolescent rats, but its effects were stronger at the higher dose. Moreover, we found stronger effects of baclofen in adolescent animals than in adult ones. In addition, baclofen at its higher dose decreased GABAB overexpression in the hippocampus of adolescent rats, but not in adult rats.

Conclusion : These findings shed new light on the mechanisms underlying the role of GABAB receptors in the retrieval of METH reward memory and highlight the importance of considering age and sleep patterns in understanding addiction. Further research could potentially lead to the development of therapeutics for individuals struggling with METH addiction.

Keywords : Methamphetamine; reward memory; REM sleep deprivation; GABAB receptors; baclofen; aging.

Count: 93
Abstract ID: 209
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

GABAB receptors play a crucial role in the reconsolidation of methamphetamine reward memory in adult and adolescent sleep-deprived rats

Submission Author: Mehdi Khodamoradi

Mehdi Khodamoradi[1], Christian P. Müller[2], Nasrin Abdoli[3]

1. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.
2. Department of Psychiatry and Psychotherapy, University Clinic, Friedrich-Alexander-University of Erlangen-Nürnberg, Schwabachanlage 6, 91054, Erlangen, Germany.
3. Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background and Aim : GABAB receptors play a modulatory role in the mechanisms underlying drug addiction, sleep problems, and aging; however, there are few studies addressing their relationship. Therefore, this study aimed to examine whether blockade of these receptors affects reconsolidation of methamphetamine (METH) reward memory in adult and adolescent rats subjected to rapid-eye movement sleep deprivation (RSD).
Methods : Adolescent and adult male Wistar rats were subjected to RSD for seven days. They were then conditioned to receive methamphetamine (METH; 2 mg/kg, ip) during an eight-day conditioning period. METH reward memory was then reactivated during a retrieval trial and the GABAB receptor agonist baclofen (2.5 or 5 mg/kg, ip) was immediately following the retrieval trial. Afterward, animals were retested for the expression of conditioned place preference (CPP) and hippocampal expression of GABAB receptors.
Results : Baclofen dose-dependently decreased the retrieval of METH reward memory in control and RSD adolescent rats, especially at its higher dose, but it did not show significant effects in adult animals. In addition, while the RSD episode showed synergistic effects with METH to induce GABAB receptor overexpression in the hippocampus of adolescent and rats, it did not affect the expression of hippocampal GABAB receptor in RSD adolescent and adult rats.
Conclusion : These findings shed new light on the mechanisms underlying the role of GABAB receptors in the reconsolidation of METH reward memory and highlight the importance of considering age and sleep patterns in understanding addiction. Further research could potentially lead to the development of therapeutics for individuals struggling with METH addiction.
Keywords : Methamphetamine; reward memory; REM sleep deprivation; GABAB receptors; baclofen; aging.

Count: 94
Abstract ID: 242
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

Involvement of AMPA receptors of lateral habenula in the expression and acquisition phases of morphine-induced place preference

Submission Author: Elahe Amohashemi

Elahe Amohashemi[1], Parham Reisi[2], Hojjatallah Alaei[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 the brain structure of the epithalamic, plays the main role in depression and drug addiction. The glutamatergic system influences morphine reward. The effect of activation/inhibition of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid-type glutamate receptors (AMPARs) in the LHb on different phases of morphine-induced conditioned place preference (CPP) remains unknown. In this research, the effect of bilateral intra-LHb microinjection of AMPARs agonist and antagonist on the acquisition and expression phases of CPP in male rats has been investigated.

Methods : Bilateral injections of agonist/antagonist (NBQX) of AMPA receptor, were performed during the conditioning sessions of the acquisition phase. In other separate groups, drugs were also injected into the LHb before the test session during the expression phase of CPP. A five-day CPP bias paradigm was used to study the effect of injections of AMPA and NBQX into the LHb on morphine reward-related behavior

Results : Different doses of NBQX, the antagonist of AMPARs, in combination with the effective dose of morphine, increased the CPP score during the acquisition phase. While AMPA, the agonist of AMPARs, significantly reduced the conditioning scores in the acquisition phase. Pretreatment with NBQX (0.5 and 1 μg/rat) reversed the inhibitory effect of AMPA (1 μg/rat) on the acquisition phase of morphine-induced CPP. The antagonist (1 μg/rat) increased the effect of a high dose of agonist (2μg/rat) on CPP. On the other hand, NBQX significantly increased CPP scores during the expression phase. AMPA did not significantly affect CPP scores in the expression phase, but significantly reduced locomotor activity in the test phase.

Conclusion : These results confirmed the importance of AMPARs in the LHb in morphine reward. Our data also suggest that injection of an AMPARs antagonist into the LHb may alter the AMPA-induced morphine response in a dose-dependent manner.

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

Count: 95
Abstract ID: 192
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Poster

The influence of hydroalcoholic extract from Khosharizeh (Echinophora platyloba L.) on the development of tolerance to the induction of hyperactivity by a high dose of morphine in mice.

Submission Author: AmirAbbas Barzegari

AmirAbbas Barzegari[1], Milad Zare[2], Amir Hossein Golestani[3]

1. Department of Biology, University of Maragheh, Maragheh, Iran
2. Department of Biology, University of Maragheh, Maragheh, Iran
3. Department of Biology, University of Maragheh, Maragheh, Iran

Background and Aim : Administration of morphine (an important medicine) in the long run may cause tolerance to its pharmacological effects. Previous research has shown that the hydroalcoholic extract of Echinophora platyloba may inhibit the reinforcing effects of this drug in a conditioned place preference paradigm. This study aimed to evaluate the impact of the plant's hydroethanolic extract on the development of tolerance to morphine-induced hyperactivity induced by a high dose of this drug.

Methods : In this study, 14 groups of male mice were randomly assigned to groups of eight. To assess the effects of drugs on locomotor activity, ten groups of the mice received saline and morphine (0.5-40 mg/kg, subcutaneously) or administered with the saline and the plant extract (25- 75 mg/kg, intraperitoneally). Moreover, during the morphine-induced hyperactivity tolerance induction phase, four groups of mice received either saline or the plant extract one hour prior to morphine.

Results : While administration of high doses of morphine had a stimulatory effect on locomotor activity, the low doses of this drug decreased this behavior. Administration of all doses of the plant extract led to a decrease in spontaneous locomotor activity. Additionally, giving the plant extract prior to morphine during the tolerance induction phase diminished the development of tolerance to morphine-induced hyperactivity in the mice.

Conclusion : The hydroethanolic extract of E. platyloba may offer protective effects against developing morphine tolerance. Therefore, it has the potential for further research as a drug in the treatment of morphine addiction.

Keywords : Morphine, Tolerance, Kosharizeh

Count: 96
Abstract ID: 172
subject: Emotion, Motivation and Behavior: Reward and the Brain
Presentation Type: Oral

The role of expected reward and efficacy in enhancing cognitive control over emotional material

Submission Author: Mostafa Toobaei

Mostafa Toobaei[1], Mohammadreza Taghavi[2], Mohammadali Goodarzi[3], Mehdireza Sarafraz[4], Laura Jobson[5]

1. Ph.D. in clinical psychology, Department of clinical psychology, Faculty of Education and Psychology, Shiraz University, Shiraz, Fars, Iran.
2. Professor in clinical psychology, Department of clinical psychology, Faculty of Education and Psychology, Shiraz University, Shiraz, Fars, Iran.
3. Professor in clinical psychology, Department of clinical psychology, Faculty of Education and Psychology, Shiraz University, Shiraz, Fars, Iran.
4. Assistant Professor in clinical psychology, Department of clinical psychology, Faculty of Education and Psychology, Shiraz University, Shiraz, Fars, Iran.
5. Associate professor, School of Psychological Sciences, Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Australia

Background and Aim : Cognitive control is necessary for goal-directed behaviours. Motivational models of Cognitive control stated that reward can enhance cognitive control allocation. Considering the lack of mechanistic models accounting for allocating cognitive control, the Expected Value of Control (EVC) theory offers a normative mechanistic account of the role of motivation in the exerting of cognitive control (Shenhav et al., 2013). The EVC for a given control signal in a given state is determined by the components of efficacy (i.e., probability that a particular consequence will occur), value of an outcome based on the possible rewards or punishments (implicit or explicit) associated with the outcome, and the cost associated with the specified intensity of control allocation (Shenhav et al., 2013; Shenhav et al., 2021). Although, some studies indicated that the amount of reward can enhance cognitive control over emotional material in healthy individuals (Padmala et al., 2019; Padmala et al., 2017), the role of other motivational components over emotional stimuli have not investigated yet. Therefore, this study aimed to examine the role of motivational components of EVC and the interaction of them with emotional stimulus in a healthy group.

Methods : This study used a within subject design. Participants (n= 31) included the public selected via social media platforms. They completed a structural clinical diagnostic interview (SCID-5-RV), the Beck Depression Inventory-II, the General Health Questionnaire-12, and a computer-based incentivized Emotional Stroop Paradigms in which levels of efficacy (high vs. low) and the value of rewards (high=150000 Rials vs. low= 20000 Rials) were presented as cues before target stimuli (words with positive, negative and neutral valence). The task included three practice blocks and a main phase which comprised a 198-trial block. At the end

of session participants received their rewards earned in the 10 trials randomly chosen of the task.

Results : The results of a 3(Valence: Positive, negative & neutral) × 2(Efficacy: high vs low) × 2(value: high vs low) repeated measure ANOVA revealed no significant main effect and interaction effect in terms of reaction time and correct ratio response in emotional Stroop. Therefore, reward cues including efficacy, value of rewards and their interaction didn't enhance cognitive control over emotional materials.

Conclusion : Overall, our findings suggest reward and efficacy couldn't improve cognitive control allocation in stimulus with emotional valence. There are three possible explanations: 1) the pathways for reward processing are different and independent of processing pathways of emotional content of words. 2) the time interval between reward cues and target stimulus could be increased to activate proactive cognitive control and 3) according to the EVC theory, there is also an internal motivation for allocating cognitive control. Therefore, it seems likely that the participants performed the task without paying attention to the reward cues but with internal motivation and a bias to do the task correctly. These findings were discussed in light of limitations, previous studies and theories.

Keywords : Cognitive Control; Emotion; Reward; Motivation; Efficacy;

Count: 97
Abstract ID: 134
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Effectiveness of Ginkgo Biloba on the Redox System in Noise-Induced Hearing Loss

Submission Author: Zeinab Akbarnejad

Zeinab Akbarnejad[1]

1. ENT and Head and Neck Research Center and Department, The Five Senses Health Institute, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : : Noise-induced hearing loss (NIHL) is a preventable condition caused by exposure to loud noise, whether for leisure or work. Oxidative stress occurs when there is an imbalance between oxidants and antioxidants in favour of the former. studies have shown that oxygen free radicals can damage hair cells following noise exposure. Antioxidant EGb 761 is a popular supplement for neurodegenerative, vascular, and audiovestibular conditions worldwide. It has several pharmacological effects. These include reducing oxidative stress, inhibiting phosphodiesterase enzymes, stabilizing cell membranes, and improving blood flow and cognitive function. This study aimed to evaluate the effect of Ginkgo biloba extract (EGb 761) on noise-induced hearing loss (NIHL) by measuring biochemical parameters.

Methods : Twenty-four Wistar male rats were divided into four groups: Control, NIHL, EGb 761, and NIHL + EGb 761, with six rats in each group. Groups 2 and 4 were exposed to white noise at a sound pressure level (SPL) of 100 dB for 3 hours per day over 3 days. Rats in groups 3 and 4 were administered EGb 761 at 100 mg/kg/day for 21 days after noise exposure. Auditory brainstem response (ABR) tests were performed in all groups before noise exposure and on days 7 and 21 after noise exposure. Intracardiac blood samples were taken on day 21 to assess biochemical parameters.

Results : Group 2 showed a significant increase in audiological measurements on days 1 and 21 after noise exposure. In group 4, the elevated ABR threshold decreased significantly on day 21. Total oxidant status (TOS) was significantly higher in group 2 than in the other groups. In group 4, Ginkgo biloba significantly increased the total antioxidant status (TAS) compared to the noise-exposed group.

Conclusion : This study showed that EGb 761 is effective in the treatment of noise-induced hearing loss (NIHL).

Keywords : Ginkgo Biloba ; Noise ; hearing loss ;oxidative stress

Count: 98
Abstract ID: 704
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Effects of chronic acamprosate in an animal model of anxiety and depression induced by salicylate

Submission Author: Maryam Farrahizadeh

Maryam Farrahizadeh[1], Ali Shahbazi[2]

1. Department of Neuroscience, 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

Background and Aim : Emotional disorders like anxiety and depression involve imbalances between the excitatory glutamatergic system and the inhibitory GABAergic system in some brain areas. Acamprosate as an effective drug for controlling alcohol dependence is suggested to act with a dual or multiple mechanism in alcohol dependence treatment via affecting on glutamatergic and GABAergic systems. This study aims to assess the effects of chronic Acamprosate on anxiety and depression in rats.
Methods : Forty-four male Wistar rats randomly were divided into five groups: Control ; Saline ; Sodium salicylate; Acamprosate; and Sodium salicylate + Acamprosate (treatment), and followed for two weeks. 7-day intraperitoneal (IP) administration of Sodium salicylate (400 mg/kg) was applied to establish a chronic model of anxiety and depression. Then, 7-day IP injection of chronic Acamprosate (400 mg/kg) was used to investigate its possible effects on anxiety- and depression-like behaviors. Anxiety and depression were evaluated on baseline day and 14th day by elevated plus maze (EPM), open field (OF), and tail suspension (TST) tests in all exprimental groups. One-way analysis of variance followed by post-hoc Tukey test was used for comparison of data.
Results : After fourteen days, percentage of open arm time parameter in EPM test was decreased in Sodium salicylate and Sodium salicylate + Acamprosate groups compare to Control; Saline; and Acamprosate groups ($P<0.5$). Percentage of central zone time parameter in OF test was reduced in Sodium salicylate group compare to Control; Saline; Acamprosate; and Sodium salicylate + Acamprosate groups ($P<0.5$). Percentage of immobility time parameter in TST was increased in Sodium salicylate group compare to Control; Saline; Acamprosate; and Sodium salicylate + Acamprosate groups ($P<0.5$).
Conclusion : Chronic Sodium salicylate can induce emotional disorders-like behaviors such as anxiety and depression in rats. Chronic Acamprosate partially reversed indicators of anxiety- and depression-like behaviors. In conclusion, Acamprosate may improve anxiety and depression by modulation of glutamatergic and GABAergic systems, and thereby exert anxiolytic- and antidepressant-like effects.
Keywords : Sodium salicylate; Acamprosate; Anxiety; Depression; Animal model

Count: 99
Abstract ID: 622
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Oral

N-methyl-D-aspartate receptor (NMDAR) blockers improved depressive behavior initiated by levetiracetam administration in mice

Submission Author: Azadeh Mesripour

Azadeh Mesripour[1], Tanin Ahmadi[2]

1. Department of Pharmacology and Toxicology, School of Pharmacy and Pharmaceutical Sciences, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Pharmacology and Toxicology, School of Pharmacy and Pharmaceutical Sciences, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Antiepileptic drugs for instance levetiracetam can exacerbate depression in epileptic patients, apart from epilepsy itself. Epilepsy augments indoleamine 2,3-dioxygenase (IDO) enzyme activity, resulting in the formation of end-product quinolinic acid, that is a N-methyl-D-aspartate receptor (NMDAR) agonist responsible in neurotoxic effects related to depression. Thus the aim was evaluating the effect of NMDAR blockers on levetiracetam induced depression.
Methods : Male NMRI mice (25±3 g, 6-8 weeks old) were used 7 in each group. Animals were daily injected with levetiracetam (20 mg/kg) for 14 consecutive days', pretreatments with dextromethorphan (30 mg/kg), MK801 (dizocilpine) (0.075 mg/kg) or imipramine (10 mg/kg) were performed 30 min before levetiracetam administration starting from day 8. The control group received normal saline (1 ml/100g) all the drugs were injected intraperitonealy. The locomotor test, forced swimming test (FST), and the novelty suppressed feeding test (NSFT) were performed to assess depressive-like behavior. Statistical significance was determined using an ANOVA followed by a Tukey's post hoc test.
Results : Following dextromethorphan pretreatment immobility time during FST was significantly lower (44.29±5.6s) than levetiracetam alone (161.4±11.8s, $p<0.001$) and the control group (109.4±6.06, $p<0.001$). MK801 significantly reduced immobility time (53.0±7.04s $p<0.001$ compared to levetiracetam). There were no significant changes in the locomotor activity among diverse treatment groups. While levetiracetam increased latency, and decreased food intake in NSFT; pretreatment with dextromethorphan and MK801 reversed these depressant effects. These behavioral changes were similar to levetiracetam-imipramine group.
Conclusion : Preventing depressive-like behavior effects of levetiracetam in mice by dextromethorphan a non-specific NMDAR blocker or MK801 a specific NMDAR blocker shows that at least in part activation of NMDAR is responsible for levetiracetam induced depression. NMDAR antagonist such as dextromethorphan is suggested for more clinical evaluation in patients treated with levetiracetam who also suffer depression.
Keywords : Mice; depression; epilepsy; N-methyl-D-aspartate receptors; levetiracetam

Count: 100
Abstract ID: 699
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Poster

Investigating the neuroprotective effect of 6-hydroxyflavone and baicalein on OLN-93 cells against glutamate-induced neurotoxicity in inhibiting cell apoptosis

Submission Author: MohammadSadegh Rabbani

MohammadSadegh Rabbani[1], Fatemeh Frozanfar[2], Seyed Ahmad Emami [3], Zahra Tayarani-Najaran[4]

1. Department of Pharmacodynamics and Toxicology, School Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Department of Pharmacognosy, School of Pharmacy , Mashhad University of Medical Sciences , Mashhad , Iran.
4. Biotechnology Research Center, Pharmaceutical Technology Institute , Mashhad University of Medical Sciences , Mashhad , Iran.

Background and Aim : Loss of nerve cells associated with glutamate toxicity is associated with certain neurological diseases such as stroke, trauma, Alzheimer's, Parkinson's, and Huntington's. An increase in the release of glutamate or a decrease in its withdrawal from the synaptic space causes disturbances in calcium homeostasis in neurons, oxidative stress, mitochondrial dysfunction, defects in the protein production cycle and neuroinflammation, and ultimately causes neuronal apoptosis and the death of neurons, astrocytes, and oligodendrocytes. will be Flavonoids have shown several neuroprotective functions in the brain, including the potential to protect neurons against damage caused by neurotoxins, the ability to suppress neuroinflammation. The purpose of this study is to investigate the neuroprotective effect of baicalein and 6-hydroxyflavone on OLN-93 cells against the neurotoxicity caused by glutamate related to inhibition of cell apoptosis.

Methods : In this study, OLN-93 cells were tested in the MTT test in the form of pre-treatment and co-treatment, in the following tests, they were performed in the form of co-treatment, in such a way that the cells were kept for 24 hours in Proximity with flavonoid compounds and ketamine and NAC in selected concentrations and exposed to glutamate (15 mM). Then, the cell viability was measured by MTT method, the amount of reactive oxygen species by ROS test, the cell apoptosis rate by flow cytometry, and changes in the level of PARP, Caspase-3 and Cytchrome C proteins by western blot method. Also, the amount of LDH released from the cells was measured.

Results : Baicalein in concentrations of 2.5 to 10 µM and ketamine in concentrations of 0.5 µM were able to significantly reduce cytotoxicity and ROS increased by glutamate. In the PI test, baicalein and ketamine were able to reduce G1 arrest compared to glutamate. . In addition, apoptosis markers such as PARP، Caspase-3 and Cytchrome C were significantly reduced by

baicalein and ketamine compared to glutamate. No significant difference was observed between the groups in the LDH enzyme release test.

Conclusion : In general, it can be concluded that baicalein may have the potential to delay or prevent cell death caused by neurodegenerative diseases by reducing inhibition of cytotoxicity caused by glutamate and reducing the amount of proteins that promote apoptosis.

Keywords : Glutamate - Neurotoxicity - Baicalein - Apoptosis - Ketamine

Count: 101
Abstract ID: 505
subject: Emotion, Motivation and Behavior: Behavioral Pharmacology
Presentation Type: Oral

Tramadol: a Potential Neurotoxic Agent Affecting Prefrontal Cortices in Adult Male Rats and PC-12 Cell Line

Submission Author: Fakhroddin Aghajanpour

Fakhroddin Aghajanpour[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 : Tramadol is a synthetic analogue of codeine that is often prescribed for the treatment of mild to moderate pains. It has a number of side effects including emotional instability and anxiety. In this study, we focus on the structural and functional changes of prefrontal cortex under chronic exposure to tramadol.

Methods : In cell culture, PC12 cells line were exposed to the tramadol concentration of 600 µM for 48 h at 37 °C and 5% CO2. In animal part, The rats were randomly subdivided into 2 groups: control and tramadol groups (n = 12 in each group). The control group was treated daily by normal saline (0.9% NaCl, oral route) for 3 weeks. In the tramadol group, rats were given tramadol hydrochloride dissolved in physiological saline orally for 3 weeks at doses of 50 mg/kg.

Results : At the cellular level, the amounts of ROS and annexin V in PC12 cells were evidently increased upon exposure to tramadol. Our findings reveal that tramadol provokes atrophy and apoptosis by the induction of apoptotic markers such as Caspase 3 and 8, pro-inflammatory markers, and downregulation of GDNF. Moreover, it triggers microgliosis and astrogliosis along with neuronal death in the prefrontal cortex. Also, anxiety-related behaviors decreased in tramadol-treated mice.

Conclusion : Overall, our results indicate tramadol-induced neurodegeneration in the prefrontal cortex mainly through activation of neuroinflammatory response.

Keywords : Tramadol, Neuroinflammatory, Prefrontal cortex, Neurodegeneration

Count: 102
Abstract ID: 602
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Oral

Factors Associated with Dental Fear and Anxiety During Pregnancy Among Women in Bojnord City in 2024

Submission Author: Hesam Hojat

Hesam Hojat[1], Fatemeh Rasouli [2], Farzaneh Rashidi[3]

1. Seyed Hesam Hojjat Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. student Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
3. Department of Midwifery, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Introduction and Objective: Dental health is a critical aspect of overall well-being during pregnancy, as it can significantly influence both maternal and fetal health outcomes. Pregnant women are often susceptible to dental anxiety, which can deter them from seeking necessary dental care. Our study aims to assess the prevalence of dental fear and anxiety among pregnant women in Bojnord city and to identify the factors associated with these psychological barriers.

Methods : Methods: This cross-sectional descriptive-analytical study was conducted among 209 pregnant women attending healthcare centers in Bojnord city during the spring of 2024. Participants were selected using simple random sampling. Data were collected through standardized questionnaires, including the Modified Dental Anxiety Scale (MDAS) for measuring anxiety levels and the Dental Fear Scale (DFS) for assessing fear levels. Clinical examinations were performed to evaluate dental health using the Decayed, Missing, and Filled Teeth (DMFT) index and the PUFA index (Pulpal involvement, Ulceration caused by dislocated tooth fragments, Fistula, Abscess). Statistical analyses were conducted using appropriate tests to explore relationships between variables.

Results : Results: The mean score for dental anxiety (MDAS) was 9.66 ± 3.98, indicating mild anxiety levels, while the mean score for dental fear (DFS) was 13.33 ± 2.69, reflecting mild fear among participants. A significant relationship was found between dental anxiety scores and factors such as gestational age, employment status, and individual dental health status. Notably, unemployed women reported higher levels of anxiety compared to their employed counterparts.

Conclusion : Results: The mean score for dental anxiety (MDAS) was 9.66 ± 3.98, indicating mild anxiety levels, while the mean score for dental fear (DFS) was 13.33 ± 2.69, reflecting mild fear among participants. A significant relationship was found between dental anxiety scores and factors such as gestational age, employment status, and individual dental health

status. Notably, unemployed women reported higher levels of anxiety compared to their employed counterparts.

Keywords : Fear, Anxiety, Pregnancy period

Count: 103
Abstract ID: 48
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Emotional and psychological violence versus physical violence: its role in regulating the emotions and motivations of couples

Submission Author: Faeze Eskandari

Faeze Eskandari[1], Maryam Akhavan Kharazi[2]

1. Phd student of Psychology, University of Tehran, Kish branch
2. Phd student of Psychology, University of Tehran, Kish branch

Conclusion : Abstract Violence in marital relationships, both mental and physical violence, has profound effects on the regulation of emotions and motivations of couples. This article has investigated the basic differences between psychological violence and physical violence in marital relationships using a systematic review research method. Relevant sources from reliable scientific databases such as PubMed, PsycINFO, and Scopus were extracted and analyzed. The purpose of this review is to compare the different consequences of these two types of violence on the emotional and motivational dynamics of couples and to review the key findings of existing studies. Studies show that psychological violence, due to its subtle and gradual nature, has more complex and lasting effects on the mental health of couples. Over time, this type of violence causes emotional erosion, chronic anxiety, and feelings of emotional dependence, which reduce the victim's motivation to leave the relationship. On the other hand, physical violence, due to its tangible and immediate nature, quickly evokes strong emotional reactions such as fear and anger, and causes faster changes in emotional interactions and motivations of the individual to leave the relationship. Victims of physical violence are usually more motivated to end the relationship due to physical threats and immediate danger. The results show that psychological violence, due to its deeper and longer-term consequences on emotion regulation, makes victims more involved in a cycle of psychological disability and emotional dependence, while physical violence with more tangible physical injuries leads to more immediate reactions and clearer motivations to leave the relationship. will be This review research contributed to a better understanding of these differences and emphasizes the importance of faster identification and intervention in psychological violence.

Keywords : Keywords: Psychological violence, physical violence, regulation of emotions, motivations of couples, marital dynamics, emotional violence, mental health, domestic violence

Count: 104
Abstract ID: 435
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Substance use disorder from the perspective of research domain criteria (RDoC): a new approach in understanding and explaining the pathology of addiction

Submission Author: Zakiyeh Lashgari

Zakiyeh Lashgari[1], Mehdi Amini[2], Zeinab Jangi[3]

1. Department of Addiction, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, Iran
2. Department of Addiction, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, Iran
3. Department of Clinical Psychology, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, Iran

Conclusion : Objective: Addiction, as a complex and multifaceted disorder, requires novel approaches for its understanding and treatment.The RDoC (Research Domain Criteria) framework, a new approach in the field of mental disorders, can aid in better understanding the underlying mechanisms of addiction and developing more effective interventions.The purpose of this study is to examine the role of RDoC in the pathology and treatment of addiction. Method: This review study involved searching scientific articles related to RDoC and addiction in databases such as PubMed, Google Scholar, and SID. Articles were identified and analyzed using keywords like "RDoC," "addiction," "pathology," and "treatment." Findings:The RDoC framework,by examining various psychological and biological functions such as positive valence systems (reward and motivation), negative valence systems (stress and anxiety), cognitive systems (executive control and decision-making), social processing (social interactions), and arousal/regulatory systems (emotional regulation), contributes to a deeper understanding of the mechanisms of addiction. This approach enhances treatment interventions tailored to the individual's needs and characteristics by focusing on different dimensions of mental and biological functioning. Research has also shown that the use of RDoC can reduce relapse rates and improve long-term treatment success. However, further studies are needed to fully identify the interactions between these dimensions and how they influence addiction pathways. Conclusion: Utilizing the RDoC framework in the pathology and treatment of addiction provides new opportunities for the development of more targeted and personalized interventions. Despite the challenges, such as shifting traditional approaches and the need for more educational and therapeutic resources, RDoC can play a crucial role in improving the quality of life for individuals with addiction and reducing the risk of relapse. This framework can lead to a better understanding of the complex interactions between biological and psychological factors in addiction and pave the way for the design of more effective treatments.

Keywords : RDoC (Research Domain Criteria), Addiction, Pathology, Personalized Treatment

Count: 105
Abstract ID: 123
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

Impact of Psychological Stress on Ovarian Reserve in Young Women

Submission Author: Ramin Ahmadzadeh

Ramin Ahmadzadeh [1], Tahereh Pourmirzaei Sheikhalikelayeh[2], Amir fattahi[3]

1. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Stress is typically characterized as a genuine ordiscerned danger to equipoise that can jeopardize anindividual's well-being. Thehypothalamic–pituitary–adrenal (HPA) axis, whichincludes the hypothalamus, pituitary gland, andadrenal glands, controls the body's adaptiveresponse to stress. The objective of this study was to investigate the impact of psychological stress on ovarian reserve in young women.
Methods : The research was conducted among participants from various fertility centers in the Tabriz District. A total of 50 women, aged between 20 and 35, participated in the study. Half of the participants were from Tabriz city, while the other half were from rural areas surrounding Tabriz. The selection criteria included women who sought medical assistance for fertility-related issues. Participants completed a questionnaire and received counseling regarding their daily lives and stress-inducing factors. They were instructed to undergo testing for serum cortisol, FSH, and AMH levels on Day 2 of their menstrual cycle, and their responses were recorded in the questionnaire. The collected data was subsequently analyzed. Informed consent was obtained from all participants, ensuring a clear understanding of the study. Medical professionals advised them to adopt a healthy diet and engage in yoga, exercise, and meditation to alleviate stress. Following the intervention, participants were asked to recheck their hormonal levels to determine whether the reduction in stress had any significant effects.
Results : The study assessed the stress levels of young women, noting serum cortisol levels in individuals with diminished ovarian reserve, as well as Antimullerian hormone (AMH) and Follicle-stimulating hormone (FSH) levels in those with reduced ovarian capacity. Elevated cortisol levels were observed in patients with low ovarian reserve.
Conclusion : The study found that younger women exhibited higher Antral follicle counts (AFC), which decreased further under psychological stress. This suggests that increased stress may temporarily enhance reproductive readiness but could potentially accelerate the aging of the reproductive system over time. However, due to the cross-sectional nature of this study, the findings should be considered preliminary.
Keywords : Infertility; Stress; Work pressure; AMH

Count: 106
Abstract ID: 237
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

An Examination of Emotional Expression in Pet Animals: Implications for Welfare and Human-Animal Interactions

Submission Author: Mohamadreza Abdollahi

Mohamadreza Abdollahi[1], mohsen kiakojori[2]

1. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad university, Garmsar, Iran
2. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad university, Garmsar, Iran

Conclusion : Background and Purpose: The emotional expression of pet animals, particularly domesticated species such as dogs and cats, is an increasingly significant area of inquiry within ethology and animal welfare studies. This essay aims to elucidate the various modalities through which pets communicate their emotional states, emphasizing the implications of these expressions for both animal welfare and the human-animal bond. Understanding the emotional lives of pets can foster more empathetic and informed caregiving practices. Search Method: A systematic literature review was conducted, encompassing empirical studies, observational research, and theoretical frameworks published in reputable journals up to August 2024. Databases such as PubMed, Scopus, and Google Scholar were utilized to identify relevant literature using keywords including “pet emotions,” “affective communication in animals,” and “human-animal relationships.” Findings: The investigation reveals a rich tapestry of communicative behaviors that pets utilize to convey their feelings. One primary modality is vocalization. Dogs and cats employ various sounds to express emotions; for example, dogs may bark, whine, or growl, signaling excitement, anxiety, or aggression, respectively. Similarly, cats use meows, purrs, and hisses, with each sound conveying distinct emotions. The frequency, pitch, and duration of these vocalizations provide valuable insights into a pet’s feelings, reinforcing the importance of attentive listening by pet owners. In addition to vocalizations, body language is crucial for emotional communication. Dogs may exhibit relaxed body postures, wagging tails, and open mouths to indicate happiness, while signs of fear or submission include cowering and tail tucking. Cats communicate through slow blinking for contentment and an arched back with puffed fur for fear or aggression. Observational studies emphasize interpreting these signals within their specific contexts to accurately understand a pet’s emotional state. Physiological responses also reflect emotional states. Pets can show changes such as increased heart rates and altered breathing patterns in response to emotions. Research using heart rate monitors and cortisol assessments demonstrates a clear connection between emotional triggers and physiological responses in both dogs and cats. The findings highlight the significance of contextual influences on emotional expression. A pet’s emotional display can vary depending on the situation; for example, a dog may show joy when greeting its owner but anxiety in unfamiliar environments. Individual differences among pets complicate emotional expression. Factors such as breed, personality, and past experiences influence how pets convey emotions, necessitating that owners recognize and adapt to their

pets' unique emotional signals. Conclusions: A comprehensive understanding of emotional expressions in pets is essential for enhancing their welfare and strengthening the human-animal bond. Educating pet owners about these emotional signals is imperative for creating supportive environments that address the emotional needs of pets, ultimately advocating for more compassionate and informed pet care practices.

Keywords : emotional expression; Human-animal interactions; Behavioral analysis; Pet animals

Count: 107
Abstract ID: 272
subject: Emotion, Motivation and Behavior: Motivation and Emotion
Presentation Type: Poster

"Heart-Centered Consciousness: Unveiling the Heart's Role in Controlling Body Balance Beyond the Brain"

Submission Author: Atefeh Rahimi

Atefeh Rahimi[1]

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

Conclusion : The article presents the Quantum Consciousness and Heart Resonance Theory, challenging the conventional view that the brain is the primary control center for maintaining the body's balance and coherence. Instead, it argues that the heart plays a central role in regulating physiological processes by generating and transmitting electromagnetic and electrical energies. Drawing on research from quantum biology, neurocardiology, and psychophysiology, the theory proposes that the heart, not the brain, is the key organ responsible for integrating and harmonizing the body's systems. While traditional models focus on the brain's role in activating responses, this article emphasizes that rhythms and patterns of physiological activity—particularly those generated by the heart—are more fundamental to the body's communication networks. The heart encodes information in neural, chemical, and electromagnetic waveforms, transmitting this data to the brain and other organs. Changes in the heart's rhythms significantly affect emotions, perception, cognition, and behavior, suggesting a bidirectional relationship between emotional states and physiological changes. A key proposition is that distinct emotional states are linked to specific physiological patterns. Of particular interest is the psychophysiological coherence mode, which emerges during sustained positive emotions and results in ordered, harmonious physiological activity. This state of coherence is associated with improved health, performance, and overall well-being, highlighting the heart's ability to positively influence the body and mind. The heart's dynamic role extends beyond emotional regulation. As the body's most consistent generator of rhythmic information, the heart possesses its own intrinsic nervous system, capable of processing information independently of the brain. This positions the heart as a central integrator of physiological signals across multiple systems. Moreover, the extensive communication between the heart and the brain—through afferent signals—shapes not only the brain's regulatory functions but also higher-order cognitive and emotional processes. This evidence supports the idea that the heart, rather than the brain, is the primary regulator of the body's balance and coherence. The article also explores how external factors, such as solar and geomagnetic activity, affect human physiological rhythms. Research suggests that these environmental forces can synchronize with the body's rhythms, influencing both individual health and collective human behavior. The Earth's magnetic fields, in particular, are proposed as carriers of physiologically relevant information, capable of influencing global consciousness and coherence. This introduces the possibility that the heart's resonance with the Earth's magnetic fields contributes to both individual and collective states of balance and health. The

convergence of quantum mechanics and biology, known as quantum biology, further supports the heart's central role in maintaining bodily coherence. Over the past few decades, research has explored how the heart's electromagnetic field impacts emotions, intuition, and cognitive processes. Ancient cultures viewed the heart as the seat of wisdom and emotion, and modern science is beginning to validate this understanding through the concept of heart intelligence. In conclusion, the Quantum Consciousness and Heart Resonance Theory proposes that the heart, not the brain, is the body's primary regulator of balance, coherence, and emotional experience. This challenges long-standing assumptions in medicine and neuroscience and opens new pathways for research into the heart's role in health, consciousness, and human experience.

Keywords : heart balance, heart-brain interaction, heart electromagnetic field, consciousness

Count: 108
Abstract ID: 197
subject: Neuropsychiatry and Psychology: Evidence-Based Psychology
Presentation Type: Oral

Exploring the Interactions Between Personality Traits, Life Satisfaction, and Familial Relationships: Insights from a Big Five Analysis

Submission Author: SeyedMahdi Sadati

SeyedMahdi Sadati[1], Tayebeh Safaei[2], Abdolrahman Sarihi [3], Sajjad Farashi[4]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Psychology, Faculty of Humanities, Shahed University, Tehran, Iran
3. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
4. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : This study investigates the complex relationships between personality traits, life satisfaction, and familial relationships, focusing on the role of the Big Five personality traits. The Big Five model, which includes openness, conscientiousness, extraversion, agreeableness, and neuroticism, is frequently used to examine individual differences. Prior research has shown that these traits significantly impact interpersonal relationships and overall life satisfaction. However, the interplay between personality traits and the quality of parental relationships remains underexplored.

Methods : A sample of 55 participants, primarily university students aged 19-25 from Hamadan, Iran, was recruited for this study. Participants completed online questionnaires, including the Persian version of the Big Five Personality Traits questionnaire, the Satisfaction With Life Scale (SWLS), and a custom-designed questionnaire assessing the quality of parental relationships. Data were analyzed using Python, employing libraries such as pandas, scipy, and statsmodels for statistical analysis.

Results : The results revealed a significant positive correlation between life satisfaction and extraversion ($r = 0.51$, $p < 0.001$), agreeableness ($r = 0.36$, $p = 0.007$), and conscientiousness ($r = 0.30$, $p = 0.029$). Conversely, neuroticism showed a significant negative correlation with life satisfaction ($r = -0.35$, $p = 0.009$). No significant relationship was found between openness to experience and life satisfaction ($r = 0.003$, $p = 0.980$). The study also found a moderate positive correlation between life satisfaction and the quality of parental relationships ($r = 0.42$, $p = 0.001$), suggesting that individuals with higher life satisfaction tended to report better parental relationships. In terms of personality traits and familial relationships, no statistically significant correlations were found between the Big Five traits and the quality of parental relationships, although conscientiousness exhibited a weak positive trend ($r = 0.23$, $p = 0.095$). A one-way ANOVA indicated a significant difference in extraversion scores between nursing students and students from other fields ($F(2, X) = 3.65$, $p = 0.033$), with post-hoc tests revealing

that nursing students had significantly lower extraversion scores compared to other students (mean difference = -7.27, p = 0.027). Regression analyses were conducted to explore reasons for remaining single and their associations with personality traits and life satisfaction. Neuroticism was significantly associated with individuals who remained single due to not finding a suitable partner (B = 9.73, p = 0.005), while "family or personal problems" were linked to lower life satisfaction (B = -10.88, p = 0.029). The regression model explained 16.8% of the variance in life satisfaction (R^2 = 0.168).

Conclusion : Overall, the study provides valuable insights into the complex interplay between personality traits, life satisfaction, and familial relationships, emphasizing the need for more nuanced research to fully understand these dynamics. The results underscore the importance of considering personality traits in psychological and sociological studies on family dynamics and individual well-being.

Keywords : Personality Traits; Life Satisfaction; Familial Relationships; Big Five Model; Parental Relationship Quality; Psychological Well-being

Count: 109
Abstract ID: 329
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Oral

Classification of Schizophrenic Patients and Healthy Controls Using Resting State Functional MRI Images and Machine Learning Approach

Submission Author: Alireza Fallahi

Alireza Fallahi[1], Darya Nazari Parvari[2], Seyed Parsa Saleh[3], Pouring Abbasi[4]

1. Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran
2. Biomedical Engineering Department, Hamedan University
3. Biomedical Engineering Department, Hamedan University
4. Shahid Beheshti Univesity

Background and Aim : Schizophrenia is a complex and heterogeneous mental disorder characterized by three distinct symptom domains: positive, negative, and cognitive impairments [1], [2]. Given the challenges in accurately identifying these symptoms and determining a definitive threshold for a schizophrenia diagnosis, researchers have been actively pursuing the development of reliable biomarkers to aid in diagnosing this disorder [3]. Several studies have employed resting-state fMRI, which measures changes in the Blood Oxygen Level Dependent (BOLD) signal during brain activity, to investigate functional alterations in the brains of schizophrenia patients [3], [4], [5], [6]. In recent years, there has been a growing trend toward using machine learning (ML) to analyze neuroimaging data and identify functional brain differences between schizophrenia and healthy groups [7], [8], [9]. This study, based on graph theory and combined with machine learning, aims to utilize this individual-level diagnosis by enhancing the accuracy of differentiating between patients and non-patients.

Methods : The resting-state fMRI dataset utilized in this research was collected by the COBRE (Center for Biomedical Research Excellence) Institute. This dataset includes 28 schizophrenia patients and 28 healthy controls, carefully selected to ensure a balanced age range of 18-66 years and equal gender distribution. Following preprocessing, four local graph theory measures were calculated for each of the 116 nodes of the AAL atlas. These graph features include degree centrality, betweenness centrality, nodal efficiency, and clustering coefficient. Feature selection was implemented using two algorithms: PCA and a genetic algorithm. SVM, KNN, and Random Forest were used as classifiers.

Results : We evaluated 5, 10, 15, and 20 of the top selected features in each feature selection method for classification. Comparing the number of used features, the PCA classifier yielded the highest accuracy using 10 features though the GA gained higher results with 15 features. Using the PCA feature selection method, the highest accuracy achieved using SVM, KNN, and RF was 0.72, 0.71, and 0.7, respectively. Using GA method yielded higher accuracies of 0.85, 0.8, and 0.82, respectively. Notably, the SVM method consistently outperformed the other classifiers in both feature selection approaches. The selected nodes based on the GA method

related to the frontal, hippocampus, and subcortical regions including; putamen and caudate have a significant role in schizophrenia.

Conclusion : This study used graph theory and machine learning to improve schizophrenia diagnosis. By analyzing resting-state fMRI data, we developed models that accurately distinguished patients from healthy controls. Genetic algorithms outperformed PCA in feature selection, leading to higher classification accuracy using SVM, KNN, and Random Forest. Our results suggest that graph theory approaches, in conjunction with genetic algorithms are promising for developing better schizophrenia biomarkers.

Keywords : Schizophrenia; Machine learning; Graph theory; Genetic algorithm

Count: 110
Abstract ID: 654
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

Exploring Cognitive Deficits in Schizophrenia: An ERP Study of the Müller-Lyer Illusion

Submission Author: Mohsen Sedaghatkish

Mohsen Sedaghatkish[1]

1. Institute for Cognitive Science Studies

Background and Aim : The Müller-Lyer illusion, where two identical lines appear different in length due to the direction of arrowheads at the ends, is a common tool used to study visual perception. Schizophrenia, characterized by impairments in perception, cognition, and reality testing, often includes deficits in higher cognitive functions such as attention and memory. Event-related potentials (ERPs) like P300 and P600 can be used to study the neural mechanisms involved in processing this visual illusion. The aim of this study is to examine differences in P300 and P600 responses between individuals with schizophrenia and healthy controls when confronted with the Müller-Lyer illusion.

Methods : The study involved 20 individuals with schizophrenia and 20 healthy controls, matched for age, gender, and education level. Individuals with schizophrenia had been under medication for at least six months. Participants were placed in a quiet environment and presented with visual stimuli, including the Müller-Lyer illusion and control lines. Electroencephalography (EEG) was used to record ERP responses, specifically P300 and P600. Participants were asked to determine whether the lines appeared identical or different, and the latency and amplitude of P300 and P600 were compared between the two groups.

Results : Both groups displayed clear P300 and P600 responses when exposed to the Müller-Lyer illusion. However, individuals with schizophrenia showed significantly reduced P300 amplitudes compared to healthy controls, suggesting deficits in attention and cognitive processing. Moreover, the P300 latency in the schizophrenia group was significantly longer, indicating slower cognitive processing. Similarly, the P600 amplitude was reduced, and its latency was prolonged in individuals with schizophrenia. This reduction in P600 amplitude and the delayed response indicated impaired ability to integrate visual information and correct perceptual judgments when faced with conflicting visual cues.

Conclusion : The results highlight key differences in how individuals with schizophrenia process the Müller-Lyer illusion. The reduced P300 amplitude and prolonged latency indicate that individuals with schizophrenia struggle with attention allocation and early cognitive processing of visual information. These findings align with previous research that has shown attentional deficits in schizophrenia. Additionally, the reduced P600 amplitude in individuals with schizophrenia suggests difficulties in integrating information and recognizing perceptual errors. This impairment in processing contradictory visual stimuli may reflect broader

cognitive deficits in schizophrenia, such as working memory and executive functioning challenges. As a Conclusion this study demonstrates that individuals with schizophrenia experience difficulties in processing the Müller-Lyer visual illusion, as reflected by deficits in both attention and cognitive integration. These deficits are evidenced by reduced amplitudes and prolonged latencies in P300 and P600 responses. The findings contribute to a better understanding of the neural mechanisms underlying cognitive impairments in schizophrenia and could serve as a foundation for developing cognitive interventions in this population.

Keywords : Schizophrenia; ERP ; Müller-Lyer Illusion

Count: 111
Abstract ID: 463
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

The effects of astaxanthin on GSH level in the brain, an antioxidant index, in a like-schizophrenia animal model

Submission Author: Fatemeh Fathtabar Firouzjaee

Fatemeh Fathtabar Firouzjaee[1], Ali Pamesi [2], Akbar Hajizadeh Moghaddam [3], Parisa Davoodi [4], Sedigheh Khanjani Jelodar[5]

1. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
2. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
3. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
4. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
5. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran

Background and Aim : Schizophrenia is a chronic mental complaint known as cognitive impairment. The exact cause of schizophrenia is not fully understood, but it is believed to result from a combination of genetic, brain chemistry, and environmental factors There has been evidence that oxidative stress plays a main role in schizophrenia pathophysiology. Astaxanthin is a powerful antioxidant and anti-inflammatory carotenoid found in certain algae and seafood like salmon and shrimp. Some studies suggest that astaxanthin can and protect against neurodegenerative diseases.

Methods : This research examines the effects of Astaxanthin (AST) against GSH levels in the brain, an antioxidant that indexes oxidative stress damage in the ketamine-induced schizophrenia model. This study divided mice into five groups: control, AST20, ketamine, and ketamine treated with AST (10,20). Oral AST administration (10 and 20mg/kg/d) is performed after intraperitoneal ketamine injection (20 mg/kg) for 14 consecutive days. The antioxidant markers, glutathione (GSH) level were measured in the cortex and hippocampus.

Results : Our results showed that the injection of ketamine into the cortex and hippocampus decreases the level of GSH ($p<0.01$) and ($p<0.05$) respectively. while the treatment with doses of 10 and 20 mg/kg of AST ($P<0.05$) significantly reversed the antioxidant markers

Conclusion : Therefore, our study showed that treating astaxanthin, a potent antioxidant, has shown promising neuroprotective effects in various models of neurological disorders. While specific studies on its effects in ketamine-induced schizophrenia in mice are limited, the general neuroprotective properties of astaxanthin suggest potential benefits

Keywords : Oxidative stress, Astaxanthin, Glutathione peroxidase, Schizophrenia

Count: 112
Abstract ID: 509
subject: Neuropsychiatry and Psychology: Schizophrenia
Presentation Type: Poster

CpG Islands Analysis of the Phenylalanine Hydroxylase Gene

Submission Author: Shiva Valaee

Shiva Valaee[1], Sheida Sodagar[2]

1. Department of Clinical Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran
2. Department of Clinical Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran

Background and Aim : Schizophrenia is a chronic disease characterized by positive, negative and cognitive symptoms. The substantia nigra and ventral tegmental areas of the brain produce dopamine, and dopamine changes can be related to schizophrenia. In the brain, the amino acid phenylalanine is converted to dopamine by phenylalanine hydroxylase enzyme after being converted to tyrosine. DNA methylation is a class of DNA modifications that occur mainly at cytosine bases followed by guanine bases (CpG sites) in mammalian genomes. Methylation of cytosines in DNA plays an important role in the regulation of gene expression. So the analysis of methylation patterns is crucial for the understanding of cell differentiation, aging processes, diseases.

Methods : In this study, The nucleotide sequence of phenylalanine hydroxylase was obtained from the GenBank (NG_008690.2:46167-126522). Using DBCAT software, we predicted possible methylation sites in the entire phenylalanine hydroxylase gene. Basic criteria is a 200 bp with CG content of 50% and ratio of observed CpG to expected CpG is greater than 0.6.

Results : Our results show that this gene has six CpG islands, one of which is very dense at position 3. site 1 with a length of 243 bp (from 6662 to 6904) has GC content: 50%, site 2 with a length of 258 bp (from 17005 to 17262) has GC content: 55%, site 3 with a length of 396 bp (from 17375 to 17770) has GC content: 52%, site 4 with a length of 275 bp (from 26271 to 26545) has GC content: 55%, site 5 with a length of 352 base pairs (from start site: 31694 to 32045) has GC content: 59% and site 6 with a length of 221bp (from 42181 to 42401) has GC content: 57%.

Conclusion : Although the effects of phenylalanine hydroxylase methylation in phenylketonuria disease have been investigated in past studies and it has been reported that brain damage can be reduced by changing the methylation of this gene, but until now, the CpG islands of this gene have not been analyzed in detail and no research has been done on schizophrenia.These results show that aberrant methylation caused by stress or other factors may play an important role in disease progression. More future studies on phenylalanine hydroxylase gene methylation in schizophrenic patients are necessary to better understand other aspects of this disease.

Keywords : Schizophrenia, Phenylalanine Hydroxylase, CpG Islands, Methylation

Count: 113
Abstract ID: 528
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

Nose-to-Brain Stimuli-Responsive Nanocarriers: Revolutionizing Therapeutic Delivery in Psychiatric Treatment

Submission Author: Samin Hamidi

Samin Hamidi[1]

1. Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : Psychiatric disorders remain a significant global health challenge, with traditional treatment approaches often limited by the blood-brain barrier (BBB) and systemic side effects. This review explores the cutting-edge development of stimuli-responsive nanocarriers for nose-to-brain delivery, a revolutionary approach in psychiatric therapeutics. By leveraging the direct pathway from the nasal cavity to the brain and incorporating smart, responsive elements, these advanced nanocarriers aim to enhance drug efficacy, improve targeting, and minimize adverse effects in treating various mental health conditions. Our methodology comprised a comprehensive literature review using major scientific databases, including PubMed, Web of Science, and Scopus. We employed a systematic search strategy with key terms such as "stimuli-responsive nanocarriers," "nose-to-brain delivery," "psychiatric disorders," and "smart drug delivery systems." The review focused on recent studies, examining various stimuli-responsive nanocarrier designs, their responsiveness to specific stimuli (e.g., pH, temperature, enzymes), and their efficacy in delivering psychiatric medications via the intranasal route. Results from our analysis reveal significant advancements in the field of stimuli-responsive nanocarriers for nose-to-brain delivery in psychiatric treatment. These smart delivery systems demonstrate remarkable abilities to change their physicochemical properties in response to specific biological triggers, enabling precise control over drug release and targeting. pH-responsive nanocarriers, for instance, showed enhanced drug release in the slightly acidic environment of the brain extracellular space, improving the bioavailability of antidepressants. Temperature-sensitive formulations exhibited improved mucoadhesion and prolonged nasal residence time, facilitating sustained release of anxiolytic drugs. Enzyme-responsive nanocarriers demonstrated targeted delivery of antipsychotics by responding to specific brain enzymes, potentially reducing off-target effects. Notably, these smart nanocarriers showed superior BBB penetration and increased drug concentration in specific brain regions relevant to psychiatric disorders, compared to conventional formulations. Preclinical studies indicated improved therapeutic outcomes, faster onset of action, and reduced systemic side effects across various psychiatric conditions, including depression, anxiety disorders, and schizophrenia. In conclusion, stimuli-responsive nanocarriers for nose-to-brain delivery represent a paradigm shift in psychiatric treatment. By combining the advantages of the nose-to-brain pathway with smart, responsive drug release mechanisms, these advanced delivery systems offer unprecedented control over therapeutic delivery to the brain. The ability to respond to specific biological cues allows for more precise targeting and personalized

treatment approaches in managing complex mental health conditions. As this field progresses, future research should focus on optimizing the stimuli-responsive mechanisms for specific psychiatric medications, conducting extensive clinical trials to validate their safety and efficacy in humans, and exploring potential long-term effects of these smart delivery systems. The integration of stimuli-responsive nanocarriers in nose-to-brain delivery holds immense promise for revolutionizing psychiatric pharmacotherapy, potentially leading to more effective, tailored, and patient-friendly treatment options for millions affected by mental health disorders.

Keywords : Nose-to-Brain drug delivery; Nano drug delivery systems; Stimuli-Responsive Nanocarriers

Count: 114
Abstract ID: 529
subject: Neuropsychiatry and Psychology: Disorders of Neurobehavior
Presentation Type: Poster

Gel-Based Nanoparticles: Advancing Targeted Drug Delivery for Central Nervous System Disorders

Submission Author: Samin Hamidi

Samin Hamidi[1]

1. Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : Central Nervous System (CNS) disorders represent a significant global health challenge, ranking among the leading causes of disability and morbidity worldwide. Despite substantial advancements in neuropharmacology, the effective management of CNS disorders remains a formidable task, primarily due to the blood-brain barrier (BBB) that severely restricts the access of therapeutic agents to their intended targets in the brain. In response to this persistent challenge, researchers have turned to innovative drug delivery systems, with a particular emphasis on gel-based nanoparticles (NPs). This review explores the cutting-edge developments in gel-based NP formulations and their potential to revolutionize the treatment of CNS disorders. Our methodology involved a comprehensive analysis of recent literature, focusing on studies investigating the application of gel-based nanoparticles in CNS drug delivery. We conducted an extensive search across major scientific databases, including PubMed, Web of Science, and ScienceDirect, using keywords such as "gel-based nanoparticles," "CNS drug delivery," and "neurological disorders." The review process entailed a careful examination of the unique characteristics, fabrication methods, and therapeutic efficacy of various gel-based NP formulations in the context of CNS treatment. The results reveal promising advancements in the field of gel-based nanoparticle drug delivery for CNS disorders. These innovative formulations demonstrate several key advantages over traditional drug delivery methods. Firstly, gel-based NPs exhibit an enhanced ability to penetrate the BBB, significantly improving the bioavailability of CNS-targeted medications in the brain. The gel matrix provides a protective environment for the encapsulated drugs, shielding them from degradation and premature release. Additionally, these NPs offer the potential for controlled and sustained drug release, allowing for more stable drug concentrations in the brain over extended periods. This characteristic is particularly beneficial for managing chronic neurological conditions that require long-term treatment, such as neurodegenerative diseases and epilepsy. Furthermore, the versatility of gel-based NPs allows for the incorporation of multiple therapeutic agents, opening avenues for combination therapies tailored to complex CNS disorders. The studies reviewed also indicate a reduction in systemic side effects, as the targeted nature of these delivery systems minimizes drug exposure to non-target tissues. Gel-based nanoparticles represent a promising frontier in targeted drug delivery for CNS disorders. By effectively navigating the BBB and offering controlled release profiles, these innovative formulations have the potential to significantly enhance the efficacy of treatments for a wide range of neurological conditions, including neurodegenerative diseases, stroke, brain tumors,

and neuroinfectious diseases. The unique characteristics of gel-based NPs, including their ability to protect and precisely deliver therapeutic agents to the brain, position them as a viable solution to overcome the longstanding challenges in CNS pharmacotherapy. As research in this field continues to evolve, future studies should focus on optimizing gel formulations for specific CNS disorders, exploring their long-term safety profiles, and conducting clinical trials to validate their efficacy in human subjects. The integration of gel-based nanoparticle technology into CNS treatment regimens could mark a significant leap forward in our ability to manage and potentially cure a wide range of neurological disorders, offering new hope to millions of patients worldwide affected by CNS conditions.

Keywords : Nanoparticle; Drug delivery; Psychiatric disorders

Count: 115
Abstract ID: 445
subject: Neuropsychiatry and Psychology: Disorders of Executive Functions
Presentation Type: Poster

Using fNIRS to Measure tDCS Effects on Cognitive Function in Individuals With and Without Attention Deficits

Submission Author: Seyedmohammadsaeid Sahaf

Seyedmohammadsaeid Sahaf[1], Farzaneh Vafaee Bagheri[2], Sara Honari[3]

1. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
3. Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : The aim of this study is to assess whether cognitive stimulation can effectively enhance cognition in individuals with and without cognitive deficits. To investigate this, we utilized transcranial direct current stimulation (tDCS) combined with functional near-infrared spectroscopy (fNIRS).

Methods : In this study, we examined two psychology students with differing levels of attention ability. One student exhibited no attention deficits, while the other had significant attention deficits. Attention was assessed using the IVA-2 test (Integrated Visual and Auditory Continuous Performance Test), which confirmed a marked difference between the two individuals. After this assessment, we analyzed their brain activity using FNIRS (a non-invasive method for measuring brain activity through changes in blood oxygen levels) during a 60-second Go/No-Go task (a test that measures response inhibition). We recorded levels of oxygenated hemoglobin (O2Hb, the form of hemoglobin carrying oxygen) and deoxygenated hemoglobin (HHb, hemoglobin that has released oxygen) in both the right and left dorsolateral prefrontal cortex (DLPFC, a brain region involved in attention and cognitive control) before and after applying tDCS(a technique that uses weak electrical currents to stimulate the brain). The tDCS was applied for 20 minutes at 2 mA, with stimulation targeting the left DLPFC and inhibition targeting the right DLPFC. This methodology aimed to explore the effects of tDCS on attention levels and related brain activity in both students.

Results : Baseline IVA-2 test results revealed marked differences between the two participants in key areas: sustained attention (36 vs. 102), inhibition (31 vs. 86), and self-control (14 vs. 106). fNIRS data, specifically O2Hb levels, showed significant differences in the L-DLPFC between the participants at baseline ($t = -8.95$; $p < 0.05$), while no significant differences were found in the R-DLPFC ($t = -8.95$; $p > 0.05$). These findings highlight distinct attention profiles, particularly in the L-DLPFC. After the tDCS intervention, fNIRS results indicated significant changes in O2Hb levels in the participant with attention deficits (MD: L-DLPFC: 0.00531, R-DLPFC: 0.00303; $p < 0.05$) and in the participant without attention deficits (MD: L-DLPFC: 0.00117, R-DLPFC: 0.00279; $p < 0.05$). These results suggest that tDCS enhances activity in

both the left and right DLPFC in both participants, with greater improvements observed in the participant with attention deficits

Conclusion : This study demonstrates that tDCS enhances brain activity in both the left and right DLPFC in individuals with and without attention deficits. However, greater improvements were observed in the participant with attention deficits, suggesting tDCS may be particularly effective in enhancing cognitive function in those with attentional impairments. Further research is needed to confirm these findings in larger samples.

Keywords : tDCS; Fnirs; Attention; DLPFC

Count: 116
Abstract ID: 288
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Investigating the effect of perceived social support, quality of life and sleep quality on suicidal thoughts in elderly patients hospitalized in psychiatric wards

Submission Author: Nasrin Abdoli

Nasrin Abdoli[1], Pegah Abdoli[2], Omran Davarinejad[3], Mehdi Khodamoradi[4]

1. Substance abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Substance abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
3. Substance abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. Substance abuse Prevention Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : It is a period of evolution and transformation in human life, which changes and many social and psychological factors have a significant impact on it, among these factors, perceived social support, quality of life and quality of sleep can affect suicidal thoughts in patients. The main purpose of this study is to determine the relationship between sleep quality and perceived social support with loneliness in elderly men.

Methods : This research is a cross-sectional-analytical study that was conducted in order to investigate the relationship between perceived social support, quality of life and quality of sleep with suicidal thoughts in elderly and middle-aged patients hospitalized in psychiatric wards. The statistical population of the research includes all patients suffering from psychiatric disorders who visited Farabi Kermanshah Hospital for treatment during 1398-1400 and were hospitalized and treated in the psychiatric departments of Farabi Kermanshah Hospital according to the psychiatrist's diagnosis, and demographic information and self-report records , medical and clinical records and information related to the level of perceived social support, quality of life, quality of sleep and their suicidal thoughts have been registered in the registry of psychiatric disorders of Kermanshah city. Completing the relevant questionnaires and registering this patient information in the registry system of psychiatric disorders and having He was over 40 years old.

Results : The findings of the research showed that there is a negative and significant relationship between sleep quality scores and feelings of loneliness with perceived social support (r=-0.63). Overall, the results show that social support alone can significantly predict suicide in elderly men and explain 58% of its variance (P<0.01). In the second model, social support and sleep quality together could predict 61% of the variance of loneliness (P<0.01).

Conclusion : Paying attention to the components of sleep quality, investigating the effect of perceived social support, quality of life and sleep quality on suicidal thoughts in elderly and middle-aged patients hospitalized in psychiatric wards. The findings of this study on the major role of social support in providing mental health, reducing suicidal thoughts The sleep of the elderly and middle-aged is emphasized. Therefore, psychologists and counselors working in this field are suggested to develop programs centered on social support and prevention of suicidal thoughts to improve the mental health of the elderly.

Keywords : Social support; perception; quality of life; quality of sleep; suicidal thoughts; elderly

Count: 117
Abstract ID: 567
subject: Neuropsychiatry and Psychology: Cognitive Disorders
Presentation Type: Poster

Canine cognitive Dysfunction syndrome: a review of its multifactorial nature

Submission Author: Mohamadreza Abdollahi

Mohamadreza Abdollahi[1]

1. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad University, Garmsar, Iran

Conclusion : Canine Cognitive Dysfunction Syndrome (CCDS) is a neurodegenerative disorder that significantly impacts aging dogs, leading to cognitive decline and various behavioral changes. As the canine population ages, CCDS has become an increasing concern for pet owners, veterinarians, and researchers. This syndrome is often compared to human Alzheimer's disease, with underlying mechanisms including neurodegeneration, oxidative stress, and neuroinflammation. Aged canine brains exhibit reduced synaptic plasticity, contributing to cognitive deficits, alongside the accumulation of beta-amyloid plaques and tau protein tangles, which mirror pathologies seen in human neurodegenerative diseases. Clinical manifestations of CCDS can vary widely among affected dogs, typically including confusion, altered sleep patterns, behavioral changes, loss of urinary control, and decreased activity levels. Recent studies have identified significant correlations between CCDS and behaviors such as aimless wandering and prolonged staring, which may serve as notable symptoms of the syndrome. The coexistence of CCDS and heart failure in senior dogs poses unique challenges, as both conditions can substantially affect quality of life. The risk of cognitive dysfunction and heart disease increases with age, often leading to complex interactions between these disorders. The relationship between CCDS and heart failure can be understood through several interconnected biological mechanisms. Heart failure often results in decreased cardiac output, leading to reduced cerebral blood flow and impaired oxygen delivery to the brain, which is particularly concerning for cognitive function. Furthermore, chronic heart failure is associated with systemic inflammation and oxidative stress, which can exacerbate neuroinflammation and contribute to neuronal damage. This inflammatory response may further impair cognitive function, highlighting the need for a comprehensive approach to managing these concurrent conditions. Lifestyle factors, such as physical activity and nutrition, play crucial roles in the development and progression of CCDS. Regular exercise has been shown to enhance cerebral blood flow, increase mitochondrial volume in the brain, and promote neurogenesis, while a balanced diet rich in omega-3 fatty acids and antioxidants can support cognitive health. Studies indicate that dogs engaging in regular physical activity exhibit lower rates of CCDS, reinforcing the importance of maintaining an active lifestyle. This review emphasizes the significance of understanding the multifaceted risk factors associated with CCDS, including age, breed predisposition, obesity, and dietary influences. Additionally, it highlights the need for veterinarians to adopt a holistic approach in assessing and managing dogs at risk for CCDS, considering the overlapping symptoms with heart failure. By implementing regular monitoring, nutritional support, behavioral enrichment, and appropriate medical management, the quality

of life for dogs suffering from both CCDS and other diseases can be improved. In conclusion, further research is essential to deepen our understanding of the pathophysiological mechanisms underlying CCDS and to develop targeted interventions that address the unique challenges posed by this condition. Understanding these factors will be crucial for formulating effective prevention and management strategies, ultimately enhancing the well-being of aging canine patients.

Keywords : Canine Cognitive Dysfunction Syndrome ; risk Factors ; dog

Count: 118
Abstract ID: 362
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Identifying Key Genes and Approved Medications Associated with Major Depressive Disorder Using Network Analysis and Systems Biology

Submission Author: SeyedMahdi Sadati

SeyedMahdi Sadati[1], Yasin Parvizi[2], Pedram Porbaha[3], Shima Masumi[4], Saeid Mahdian[5], Seyed Alireza Vafaei[6], Saeid Afshar[7]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
2. School of Medicine, Student Research Committee, Hamadan University of Medical Sciences, Hamadan, Iran
3. Department of Pharmaceutics, School of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran.
4. School of Medicine, Student Research Committee, Hamadan University of Medical Sciences, Hamadan, Iran
5. Behavioral Disorders and Substance Abuse Research Center, Hamedan University of Medical Sciences, Hamedan, Iran
6. Hamadan University of Medical Sciences, Hamadan, Iran
7. Department of Medical Biotechnology, School of Advanced Medical Sciences and Technologies, Hamadan University of Medical Sciences, Hamadan, Iran.

Background and Aim : Objective: Major depressive disorder (MDD) stands as one of the serious psychiatric conditions that detrimentally affect patients' quality of life and leads to a significant part of disability worldwide. Due to the limited understanding of the basic molecular mechanisms of depression and antidepressant medications, a clear understanding of the onset and development of MDD is unavailable. This study aims to figure out the pivotal genes and pathways implicated in the MDD development and identify medications that can potentially improve MDD treatment based on their relation with the key genes.

Methods : Method: Symbols of human coding genes were retrieved from the HUGO Gene Nomenclature Committee database. These symbols were then queried for MDD-related associations using a Python script in PubMed. Subsequently, genes with two or more related articles to MDD were selected. A union of our search data and MDD-related genes in the DisGeNET database was found. The gene interaction network was generated and analyzed utilizing the STRING and Cytoscape, respectively. Finally, a drug-gene network was constructed and medications that can affect multiple genes were selected.

Results : Results: The union of our search data and DisGeNET data contained 1734 genes. Based on network analysis, TNF, IL1B, IL6, STAT1, and STAT3 were identified as the key genes in the MDD pathogenesis. Eleven drugs that affect more than one gene were detected through a drug-gene network. These medications include Acitretin, Adalimumab, Alteplase,

Cisplatin, Digoxin, Etanercept, Infliximab, Insulin, Omeprazole, Pentoxifylline, and Rabeprazole.

Conclusion : Conclusion: In summary, our findings identified five genes as key genes in MDD development, as well as medications related to key genes. This study provides a new vision of the pathogenesis and treatment of MDD. However, further experimental and clinical studies are necessary.

Keywords : Antidepressive Agents; Depressive Disorder; Drug Therapy; Major; Protein Interaction Maps; Systems Biology

Count: 119
Abstract ID: 352
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

Systematic Review of Clinical Trials in Depression Diagnosis Using Eye-Tracking Technology

Submission Author: Elnaz Shahmoradpour

Elnaz Shahmoradpour[1], Jaber Alizadehgoradel[2]

1. Department of Psychology, Islamic Azad University, Khalkhal Branch, Khalkhal, Iran.,
2. Department of Psychology, Faculty of Humanities, University of Zanjan, Zanjan, Iran

Conclusion : These challenges highlight that while eye-tracking devices can serve as effective tools for diagnosing depression, there is a need for further research and improved research protocols. In particular, standardizing research methods and increasing sample sizes could enhance the validity and generalizability of the results. Ultimately, by identifying and addressing these challenges, we can develop better and more accurate diagnostic tools for depression.

Keywords : Depression , Eye-tracking, Diagnosis

Count: 120
Abstract ID: 36
subject: Neuropsychiatry and Psychology: Mood Disorders
Presentation Type: Poster

The Role of Neuroplasticity in Depression and Treatment

Submission Author: Shadi Sarahroodi

Shadi Sarahroodi[1]

1. Department Of pharmacology and Toxicology, School of Pharmacy, Tehran Medical Sciences Islamic Azad University.

Conclusion : Depression, a pervasive mental health disorder affecting a significant portion of the global population, extends beyond a simple chemical imbalance. Recent scientific inquiry has illuminated the critical role of neuroplasticity—the brain's inherent ability to reorganize and adapt—in both the pathogenesis and treatment of this multifaceted condition. Conceptually, the brain can be envisioned as an intricate network of interconnected pathways. Depression disrupts these pathways, leading to discernible structural and functional aberrations. Studies have documented reductions in the volume of crucial brain regions, including the hippocampus, integral for memory consolidation, and the prefrontal cortex, implicated in executive function and emotional regulation. Moreover, communication between distinct brain areas can become compromised, hindering optimal cognitive and emotional processing. These alterations are hypothesized to arise from impaired neuroplasticity. Chronic stress, a well-established risk factor for depression, can negatively impact neurogenesis, the birth of new brain cells, and weaken synaptic plasticity, the strengthening and weakening of connections between neurons. This, in turn, diminishes the brain's capacity for adaptation and recovery. Fortunately, we are not beholden to these maladaptive changes. Just as negative experiences can negatively sculpt the brain, positive interventions can foster positive neuroplasticity. Therapeutic approaches like cognitive-behavioral therapy (CBT) empower individuals to recognize and modify detrimental thought patterns, effectively rewiring maladaptive neural circuits. Exercise, a potent driver of neuroplasticity, stimulates neurogenesis, enhances synaptic plasticity, and mitigates the deleterious effects of stress. Pharmacological interventions, such as antidepressants, can also promote neuroplasticity by increasing the availability of neurochemicals essential for neuronal growth and communication. Novel therapies like transcranial magnetic stimulation (TMS) and deep brain stimulation (DBS) offer targeted modalities to modulate brain activity and enhance neuroplasticity in specific brain regions implicated in depression. Despite considerable progress, our understanding of neuroplasticity in the context of depression is still evolving. Future research endeavors should delve deeper into the intricate mechanisms underlying neuroplasticity and strive to develop more targeted and effective interventions. By adopting a holistic approach that integrates traditional treatments with lifestyle modifications and innovative therapies, we can empower individuals to rewire their brains, fostering resilience and paving the way for enduring recovery from depression.

Keywords : Depression, Neuroplasticity, Brain

Count: 121
Abstract ID: 222
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Unraveling the Gut-Brain Axis in Canine Anxiety: Emerging Challenges for Veterinary Behavioral Medicine

Submission Author: Sara Seraj

Sara Seraj[1], Mohammad Saleh Safari[2]

1. Veterinary Faculty, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.

Conclusion : Understanding the gut-brain axis in canine anxiety introduces novel therapeutic strategies, such as targeting gut microbiota to alleviate behavioral symptoms. Despite encouraging early results, the field faces challenges such as standardizing treatment protocols and identifying specific microbial species that most influence behavior. Future research should focus on large-scale clinical trials to establish efficacy and safety of microbiota-based therapies in veterinary practice. The findings highlight the potential of gut-brain axis modulation as a key tool for managing anxiety in dogs.

Keywords : Canine Anxiety, Gut-Brain Axis, Behavioral Medicine.

Count: 122
Abstract ID: 31
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Comparison of existential anxiety in urban and rural elderly

Submission Author: Iraj Mirkhan

Iraj Mirkhan[1], Jamal Mostafazadeh derik[2], Rojin Saidi[3]

1. Ph.D. in Cognitive Neuroscience - Brain and Cognition, Department of Psychology, Payam Noor University Urmia, Urmia, Iran
2. Department of Psychology, Payam Noor University Urmia, Urmia, Iran
3. Department of Psychology, Payam Noor University Urmia, Urmia, Iran

Background and Aim : Old age can be associated with many challenges for anyone; According to the situation and conditions of the elderly, the challenges of this course can be positive or negative; Therefore, the present study was conducted with the aim of comparing existential anxiety in urban and rural elderly.

Methods : The current research is causal-comparative. The statistical population of the research includes all the elderly living in the city and village in Urmia city in the winter of 1402. Using available sampling method, 50 urban and 50 rural elderly were selected and responded to Good and Good (1974) Existential Anxiety Questionnaire. The data was analyzed with t test and spss 19 software.

Results : The results of the t-test showed that there was a difference in existential anxiety between the urban and rural elderly groups ($P < 0.05$) and the rural elderly experienced higher existential anxiety than the urban elderly.

Conclusion : According to the obtained results, it can be said that the place and living environment can play a role in the formation of existential anxiety, and this means that the rural elderly reported higher existential anxiety. By focusing on the results of the present study, measures can be taken to reduce the existential anxiety of the elderly.

Keywords : existential anxiety, urban and rural elderly

Count: 123
Abstract ID: 239
subject: Neuropsychiatry and Psychology: Anxiety Disorders and PTSD
Presentation Type: Poster

Troxerutin can improve on depressive-like behaviors induced by chronic mild stress in male rats

Submission Author: Maryam Azarfarin

Maryam Azarfarin[1], Fereshteh Farajdokht[2], Shirin Babri[3], Farzad Salehpour[4], Milad Taghizadeh[5], Gisou Mohaddes[6]

1. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
2. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
3. Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
4. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
5. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran
6. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Chronic stress has been associated whit the pathophysiology of mood disorders, such as depression and anxiety. We aimed to assessment the effect of troxerutin (TRX), as a flavonol, on stress-induced depression and anxiety.

Methods : This study, we used 56 rats were at random divided into seven groups (n=8 per group) as follows: control, saline, TRX 50, TRX 150, TRX 300, Diazepam, and Imipramine. Chronic mild stress (CMS) was induced via restraining animals in Plexiglas cylinders for 1 hours each day for 25 continuous days. Diverse doses (50, 150, and 300 mg/kg, as orally) of troxerutin administrated orally for 14 continuous days. At the end of treatments, anxiety- and depressive-like behaviors were tested using forced swimming test (FST), elevated plus-maze (EPM), and open field test (OFT).

Results : Chronic mild stress significantly augmented immobility and declined swimming time in FST. nevertheless, diverse doses of troxerutin significantly declined immobility and increased swimming time. CMS also significantly declined the percentage of open arm entrance (%OAE), whiles troxerutin significantly increased both %OAE and percentage of open arm time (%OAT) in the EPM. Moreover, CMS significantly declined time spent in the center and the number of center entrances in the OFT. However, troxerutin significantly increased time spent in the center and number of the entrances crossing. Furthermore, CMS significantly enhanced serum cortisol levels and troxerutin declined it.

Conclusion : Troxerutin has effects anti-anxiety and antidepressant-like in rodents, that can suggested the use of herbal medicine in the mood disorders.

Keywords : Anxiety, Chronic mild stress, Cortisol, Depression, Troxerutin

Count: 124
Abstract ID: 60
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Poster

Compulsive Disorder in Dogs: A Review of Genetic and Environmental Factors, Symptoms, Diagnosis, and Treatment

Submission Author: Mohamadreza Abdollahi

Mohamadreza Abdollahi[1], Amir Afkhamigoli[2], Seyed Mohamadmoein Hamdi[3], Dorsa Sadat Hosseini Tabatabaei[4], Alireza Ayati[5], Darya Moghtadaei manesh[6]

1. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad University, Garmsar, Iran
2. Department of Basic Sciences, Faculty of Veterinary Medicine, Ferdowsi University, Mashhad, Iran
3. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad University, Garmsar, Iran
4. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad University, Garmsar, Iran
5. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad university, Garmsar, Iran
6. Department of Basic Sciences, Faculty of Veterinary Medicine, Islamic Azad university, Garmsar, Iran

Conclusion : Background and Objective: Similar to humans, Obsessive-Compulsive Disorder (OCD) is also present in dogs, referred to as Canine Compulsive Disorder (CCD). This behavioral disorder is characterized by repetitive and atypical behaviors that lack a specific goal, resulting in a sequence of abnormal, exaggerated, and persistent actions that negatively impact daily life. The disorder can become so destructive and unmanageable that owners may consider surrendering their dogs to shelters or opting for euthanasia. This study aims to review the understanding, diagnosis, and treatment methods of CCD. Methodology: To identify relevant published articles, databases such as PubMed, Google Scholar, and ScienceDirect were utilized. The search employed keywords including “compulsive disorder,” “repetitive behaviors,” “diagnosis,” “treatment,” “symptoms,” and “dogs” in various combinations and in English. No time restrictions were applied, and all relevant articles meeting the inclusion criteria were manually reviewed. Findings: The incidence age of compulsive disorders in dogs may be similar to that experienced by human patients, often appearing in the pre-adolescent stage (6 to 12 months in dogs), indicating a potential genetic vulnerability to this disorder. Studies have shown that genes such as CDH2, CTNNA2, ATXN1, and PGCP play significant roles in CCD. Serotonergic and dopaminergic abnormalities have been identified in dogs with CCD, which resemble findings in humans with the disorder. In these dogs, abnormal dopamine transporter ratios are present in both the left and right striatum, as well as a significant reduction in subcortical perfusion and serotonin transporter availability in the hypothalamus. Genetically, Bull Terriers, Doberman Pinschers, and German Shepherds show a higher predisposition to develop compulsive pathology. CCD is associated with dietary supplements, spaying/neutering status, and the number of conspecifics in the household. Neutered female dogs are more frequently affected, suggesting the influence of ovarian hormones on CCD. Neuroanatomically, neuroimaging studies indicate the involvement of parallel circuits, specifically the cortico-striato-thalamo-cortical (CSTC) pathways, in the pathophysiology of CCD. Symptoms of CCD in dogs include spinning, barking, chewing toys, self-injury, and acral lick dermatitis, all of which significantly impact their daily lives. Tail chasing (TC) is a

compulsive behavior exhibited by these dogs, characterized by a period of staring at their tail before continuing the chase. Diagnosis of CCD primarily relies on a precise history and the exclusion of other potential causes for the observed behaviors, such as food intolerances, parasites, skeletal and joint issues, and skin and neurological diseases. Therapeutic interventions aimed at addressing CCD in dogs mainly involve the use of selective serotonin reuptake inhibitors (SSRIs) and serotonin transporter inhibitors (SERT), as well as norepinephrine transporter inhibitors (NET) or glutamate blockers. Alongside these therapeutic interventions, positive reinforcement strategies should be employed to encourage desirable behaviors and improve the human-animal bond. Conclusion: CCD is diagnosed based on the persistent repetition of behaviors that are disproportionate to the circumstances. Genetic and environmental factors play significant roles in the involvement of dogs with this disorder. While a definitive diagnosis for CCD remains elusive, numerous treatment options have been proposed. A deeper understanding of CCD necessitates further studies in this field.

Keywords : compulsive disorder ; diagnosis ; treatment ; dog

Count: 125
Abstract ID: 665
subject: Neuropsychiatry and Psychology: Obsessive Compulsive Disorders
Presentation Type: Poster

Comparison of neuropsychological profile and cognitive emotional regulation in obsessive-compulsive disorder patients and mild cognitive disorder patients

Submission Author: Mehrbanou Hosseinirad

Mehrbanou Hosseinirad[1], Abolfazl Vahidi[2]

1. Yazd University of Medical Sciences, Yazd, Iran
2. Yazd University of Medical Sciences, Yazd, Iran

Background and Aim : This study aimed to investigate the neuropsychological profiles and emotional regulation patterns in individuals with obsessive-compulsive disorder (OCD). Cognitive impairments, particularly in areas of executive functioning and emotional regulation, have been linked to OCD, impacting patients' quality of life and mental health. The research focuses on identifying cognitive and emotional regulation strategies that distinguish OCD patients from healthy individuals, thereby contributing to the understanding of OCD management.

Methods : The study sample consisted of 60 individuals diagnosed with OCD, aged between 30 and 40 years. Data were collected using structured questionnaires and neuropsychological tests. The participants' emotional regulation strategies and cognitive impairments were assessed and compared to a control group. Statistical analyses, including covariance analysis, were used to test the proposed hypotheses.

Results : Findings indicated significant differences in emotional regulation and neuropsychological profiles between OCD patients and healthy individuals. OCD patients displayed higher levels of cognitive impairment, particularly in tasks related to attention, memory, and emotional regulation. Emotional regulation strategies such as suppression and rumination were more prevalent among the OCD group, while the control group demonstrated healthier coping mechanisms.

Conclusion : The study concluded that individuals with OCD exhibit distinct neuropsychological profiles and emotional regulation patterns compared to healthy individuals. These findings suggest that targeted interventions focusing on improving cognitive function and emotional regulation could enhance the quality of life for OCD patients. Future research should explore these interventions in larger populations to validate these results.

Keywords : Obsessive-compulsive disorder, cognitive impairment, emotional regulation, neuropsychological profile

Count: 126
Abstract ID: 640
subject: Neuropsychiatry and Psychology: Eating Disorders
Presentation Type: Poster

Investigating the therapeutic potential of psilocybin and its impact on neuroplasticity in anorexia nervosa

Submission Author: Sara Jalali

Sara Jalali[1], Mohammadamin Bagherian[2], Dorrin Tabesh[3], Negar Lotfi[4], Arya Jafarzadeh[5]

1. Farzanegan 1 highschool
2. Esfahan Ejei 2 highschool
3. Tehran Farzanegan 1 highschool
4. Tehran Farzanegan 2 highschool
5. Esfahan Ejei 2 highschool

Conclusion : Anorexia nervosa (AN) is a psychiatric disorder characterized by a distorted body image, restrictive eating, and an intense fear of weight gain. It has one of the highest morbidities and mortalities of any psychiatric disorder. Many individuals with AN experience a long-lasting, severe form of the illness termed “severe-enduring” AN that significantly shortens their lifespan. There are no effective biological treatments for AN, and psychological and weight restoration treatments have inconsistent success rates. Therefore, novel therapeutic approaches are being considered. Neuroplasticity, the brain's ability to adapt and change, plays a crucial role in the development and maintenance of AN, but is severely disturbed in these patients. Neuroplasticity includes the formation of new neural connections, the strengthening or weakening of existing connections, and the reorganization of brain regions. Recent studies have investigated the possible therapeutic effects of psilocybin -a psychedelic compound found in certain mushrooms which can produce profound changes in perception, and emotion- on neuroplasticity and AN. Psilocybin can directly act on serotonin receptors in the brain and potentially modulate mood and several other cognitive functions. Additionally, activation of serotonin receptors in the gut by psilocybin could influence cortical neuroplasticity and mental health outcomes via stimulation of the vagus nerve. Emerging evidence has demonstrated that psilocybin-assisted therapy can improve the symptoms of AN. Due to unsuccessful rates of therapies established for AN, it’s crucial to further investigate novel approaches. As studies have already shown psilocybin’s impact on other psychological conditions, such as depression, the therapeutic potential of psilocybin has opened a new window into the treatment of anorexia nervosa by targeting neuroplasticity and certain brain circuits. Psilocybin is hypothesized to mitigate neurobiological and behavioral features associated with AN, for example, by normalizing serotoninergic transmission, promoting neuroplasticity via increasing BDNF and glial cell line-derived neurotrophic factor, and improving cognitive flexibility. However, it is important to note that research on psilocybin is still in its early stages, and more studies are needed to fully understand its therapeutic potential. Unfortunately, the use of psilocybin in clinical settings is currently limited and subject to regulatory approval. In conclusion, further research is needed to fully understand its mechanisms of action and to establish its safety and

efficacy in clinical settings. This review paper will investigate the existing literature on the therapeutic effects of psilocybin on neuroplasticity in AN.

Keywords : Anorexia nervosa; Psilocybin; Neuroplasticity; Serotonin

Count: 127
Abstract ID: 276
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Atorvastatin's Role in Mitigating Relapse: An Investigation into Stress-Induced Drug-Seeking Behavior

Submission Author: Niloofar Aghajani

Niloofar Aghajani[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 : Addiction is characterized as a chronic and recurrent disorder marked by compulsive drug-seeking behaviors and continued substance use despite adverse consequences. The profound societal damage wrought by addiction underscores the urgency to address this global crisis. A principal challenge in combating addiction is the phenomenon of relapse, a multifaceted process involving numerous brain regions and neurotransmitter systems. The re-initiation of drug use may be triggered by environmental cues previously associated with substance use, exposure to stressors, or direct re-exposure to the drug. Among these factors, stress constitutes a particularly significant contributor. The enduring neurobiological alterations that occur during the addiction recovery process necessitate therapeutic interventions that can help restore normative brain function and minimize the risk of relapse. In light of this, recent research has turned its focus toward the pharmacological class of statins. Statins are established pharmacotherapeutics for dyslipidemia, having demonstrated safety and efficacy over decades of clinical use. Given their ubiquitous application, the exploration of their diverse physiological effects has garnered considerable attention. This study aims to investigate the potential of atorvastatin to influence rates of relapse in relation to stress-induced drug-seeking behavior.

Methods : This investigation employed a self-administration paradigm. Initially, a cohort of rats, each weighing between 300-350 grams, underwent surgical procedures to insert a catheter into the jugular vein. Post-operative recovery was followed by acclimatization to a self-administration apparatus. Over a two-week period, the subjects received intravenous morphine daily for two hours via a lever-pressing response. Following this phase, the rats entered a morphine extinction period and were subsequently allocated into two experimental groups: saline control and atorvastatin treatment. The saline group was administered intraperitoneal saline daily for two weeks, whereas the atorvastatin group received intraperitoneal atorvastatin under the same regimen. Upon completion of drug administration, both cohorts were subjected to a stress paradigm (via foot shocks) prior to re-entry into the self-administration apparatus to assess the influence of atorvastatin on the propensity to resume drug-seeking behavior post-stress.

Results : Data analysis revealed that the atorvastatin-treated group exhibited a significantly reduced inclination toward morphine self-administration following stress exposure compared to the saline control group. Specifically, lever-pressing behavior to obtain morphine was markedly decreased in the atorvastatin cohort after the stress challenge.

Conclusion : The findings of this study, corroborated by existing literature, indicate that atorvastatin substantially attenuates the propensity for relapse in response to stress. Consequently, atorvastatin emerges as a promising candidate for therapeutic intervention aimed at mitigating drug-seeking behavior during critical extinction periods.

Keywords : addiction- morphine- relapse- atorvastatin-self administration

Count: 128
Abstract ID: 177
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Psilocybin effect on alcohol addiction with an insight to gut-brain axis: A narrative review

Submission Author: Pouya Karami Dehkordi

Pouya Karami Dehkordi[1], Ehsan Saboory[2], Samaneh Ahmadian Moghadam[3], Sima Jahanbakhsh[4], Maryam Jahanbakhsh[5]

1. School of Medicine, Zanjan University of Medical Science, Zanjan, Iran
2. Department of addiction studies, School of Medicine, Zanjan University of Medical Science, Zanjan, Iran
3. Department of addiction studies, School of Medicine, Zanjan University of Medical Science, Zanjan, Iran
4. School of Medicine, Zanjan University of Medical Science, Zanjan, Iran
5. School of Medicine, Zanjan University of Medical Science, Zanjan, Iran

Conclusion : Our review suggests further research into the gut-brain axis and its interaction with more neurotransmitters to reveal a better response to psychedelic therapies, including AUD.

Keywords : Psilocybin; alcohol; alcohol addiction; gut-brain axis

Count: 129
Abstract ID: 250
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Poster

Determinantal role of emotion in decision-making impairment of substance-dependent individuals

Submission Author: Fateme Saghi

Fateme Saghi[1]

1. ferdowsi university of mashhad

Conclusion : The impairment of decision-making has emerged as a significant cognitive deficit that may contribute to the persistence of abuse, despite its adverse consequences. This phenomenon can be partially explained by the somatic marker hypothesis, which posits that emotions and their associated bodily states play a crucial role in signaling the brain, thereby influencing decision-making processes toward more beneficial choices. according to somatic marker hypothesis the reason behind this abnormal performance could be linked to deficits in functioning of ventromedial prefrontal cortex which leads to a decreased emotional(and physiological) reaction to negative(or positive) future imaginaries, this prevent them from biasing their decisions toward most beneficial ones using emotional cues, therefore they show impulsive choices and behaviors. those with substance dependence(SD) and Patients with damage to the ventromedial prefrontal cortex (VM) often make similar poor decisions. They tend to choose immediate rewards, like drugs or alcohol, even if it risks serious future problems, such as losing their job or family. While scans show that SD individuals don't have structural damage in the VM, other studies reveal functional issues in those who abuse substances like cocaine and alcohol. Researchers use a decision-making test called the Iowa Gambling Task, which mimics real-life choices involving uncertainty, rewards, and penalties. This task has been effective in identifying decision-making problems in people with VM damage, and studies show that substance abusers perform poorly on it as well. Bechara et al. identified three neuropsychological subtypes in individuals with substance dependence by analyzing autonomic function during gambling tasks. Their study involved 46 patients in drug rehabilitation, meeting DSM-IV criteria for substance dependence, including alcohol, cocaine, and amphetamine users. Compared to healthy controls and patients with ventromedial prefrontal cortex (PFC) damage, the substance-dependent group exhibited gambling performance that fell between the two, suggesting a learning deficit. Notably, 63% of this group displayed deficits akin to ventromedial PFC dysfunction, consistently choosing risky options, while 37% performed similarly to controls from the outset. Physiological measurements supported these findings, showing impaired individuals lacked anticipatory skin conductance responses (SCR) while non-impaired individuals developed them. A follow-up study utilized a modified Gambling Task to distinguish between hypersensitivity to immediate rewards and insensitivity to long-term punishment. Among those impaired in the original task, about one-third were also impaired in the modified task, indicating a disregard for future consequences. The remaining two-thirds managed to adapt their strategy based on reward feedback despite

their initial impairment. This subgroup exhibited exaggerated SCR to rewards and increased anticipatory SCR for safe options over time. The findings suggest that these individuals displayed a hypersensitivity to reward coupled with hyposensitivity to punishment, potentially linked to amygdala imbalances affecting decision-making processes. overall alternation of emotional signaling whether its hyposensitivity to the pain of punishment or hypersensitivity to the pleasure of rewards plays a crucial role in maintaining abuse. Focusing on this phenomenon could have implications for pharmacological and rehabilitative treatment strategies

Keywords : decision making;somatic marker;addiction

Count: 130
Abstract ID: 29
subject: Neuropsychiatry and Psychology: Addiction (Drug, Alcohol, Internet, Food) and Gambling
Presentation Type: Oral

A new neural diathesis-stress model of cannabis addiction based on the diurnal cortisol pattern and childhood maltreatment in users

Submission Author: Bijan Pirnia

Bijan Pirnia[1], Ali Soleimani [2], Ali Farhoudian[3], Alireza Zahiroddin[4]

1. Behavioral Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran - Bijan Center for Substance Abuse Treatment, Tehran, Iran
2. Department of Psychology, Faculty of Humanities, University of Science and Culture, Tehran, Iran
3. Department of Psychiatry, Tehran University of Medical Sciences. Tehran, Iran
4. Department of Psychiatry, Behavioral Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Childhood maltreatment (CM) appears to serve as a link between dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, which is considered a biological vulnerability, and the intensity of cannabis use. We have proposed a novel neural diathesis-stress model that is linked to cannabis dosage.

Methods : Data were collected from the Iranian Network Studying Cannabis consumption-Childhood abuse Interactions (IRNS-CCI) between September 1, 2019, and May 1, 2023, using an epidemiological approach. Through purposive sampling, Four hundred sixty adult men were selected from those seeking assistance from the Congress sixty Human Revivification Society. Two criteria, the cortisol awakening response (CAR) and the diurnal cortisol slope (DCS) in saliva, were assessed using ElectroChemiLuminescence (ECL), while carboxylic acid levels in urine were evaluated through gas chromatography/mass spectrometry (GC/MS). We used structural equation modelling (SEM) to examine the model fit.

Results : Preregistered analysis indicated inadequate model fit for our data and that the risk factors did not mediate between the diurnal cortisol pattern and heavy cannabis use. Nonetheless, according to our hypothesis, CM indicators served as a mediator between them. Exploratory analysis suggested that a model incorporating two CM indicators (emotional abuse and emotional neglect) as mediators best fits our data.

Conclusion : The findings underscore the significance of the interaction between the HPA axis and CM in the heightened clinical expression of cannabis use disorder (CUD) in adulthood. It is recommended that trauma histories, including developmental trauma disorder (DTD) and complex trauma, be incorporated into psychiatric nosology for modifying the understanding of cannabis use disorders.

Keywords : Addiction, Cannabis, Childhood ,Maltreatment, Diathesis-Stress Model, Diurnal Cortisol Pattern

Count: 131
Abstract ID: 328
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Unraveling the psychiatric complications of Dengue: A Narrative review

Submission Author: Mohammadsadegh Kamran

Mohammadsadegh Kamran[1], Adrina Habibzadeh[2]

1. 1.Student Research Committee, Fasa University of Medical Sciences, Fasa, Iran 2.USERN Office, Fasa University of Medical Sciences, Fasa, Iran
2. 1.Student Research Committee, Fasa University of Medical Sciences, Fasa, Iran 2.USERN Office, Fasa University of Medical Sciences, Fasa, Iran

Conclusion : Dengue fever is a substantial worldwide health challenge, with growing knowledge of its persistent neuropsychiatric effects. This narrative review investigates the psychiatric issues after Dengue infection, highlighting depression, anxiety, mania, and associated diseases. Studies indicate that post-dengue depression is usual, with survivors commonly experiencing significant mental health difficulties during the rehabilitation phase (1). In addition, the severe variant of the disease, Dengue hemorrhagic fever, has been related to higher neuroinflammation, which may increase psychological and cognitive outcomes (2). Studies show, that individuals recovering from Dengue fever mostly experience anxiety and depression symptoms, underlining the importance of mental health support through the post-infection period (3). Also, delayed anxiety and depression disorders have been reported in multi-ethnic metropolitan communities, particularly among individuals with prolonged recovery durations (4). These findings highlight the importance of early psychiatric assessment and intervention. Secondary mania is an unusual but considerable neuropsychiatric consequence, as demonstrated by a case involving Dengue disease. This indicates that the virus could cause extensive neurochemical disruptions, requiring additional investigation into its pathogenic mechanisms (5). The burden of several pathogen exposures, including Dengue, has been associated with higher inflammatory markers, which correlate with increased incidences of depression, particularly among the elderly (6). Psychological health and public perceptions also play a critical role in shaping the disease's mental health burden. Studies reveal that negative perceptions and stress related to Dengue fever contribute to worsened psychological outcomes in affected individuals (7). Additionally, a nationwide cohort study identified a higher risk of anxiety disorders, depressive disorders, and sleep disturbances in patients post-Dengue infection, suggesting that the mental health impacts may persist long after the acute phase of the illness (8). Recently, studies have started investigating the mental and neurological effects of Dengue and COVID-19. The data suggest major similarities, especially in the prevalence of cardiovascular, neuropsychiatric, and immunological implications, demanding additional investigation (9). Finally, extensive research has shown that neurological or psychiatric disorders following Dengue fever are not uncommon, underscoring the need for heightened clinical awareness and interdisciplinary approaches to managing these long-term effects (10). This review consolidates existing literature on post-Dengue psychiatric complications, aiming to enhance understanding and stimulate further research in this domain.

Greater awareness and early intervention are crucial in improving the quality of life for Dengue survivors facing long-term psychological impacts.

Keywords : Dengue fever; Neuropsychiatric effects; Post-dengue depression; Anxiety disorders; Neuroinflammation; Psychiatric complications

Count: 132
Abstract ID: 475
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Decreasing mental fatigue in sprint runners by mindfulness and brain stimulation

Submission Author: Farimah Mahinpour

Farimah Mahinpour[1], Mahboubeh Ghayournajafabadi[2]

1. Department of Behavioral and Cognitive Sciences, Faculty of Sports and Health Sciences, University of Tehran
2. Department of Behavioral and Cognitive Sciences, Faculty of Sports and Health Sciences, University of Tehran

Background and Aim : Mental fatigue poses a considerable obstacle to achieving peak performance in sprint runners, frequently diminishing their concentration, reaction speed, and overall athletic effectiveness. Furthermore, the findings highlight the potential benefits of employing these methods in tandem, suggesting that they may complement each other in alleviating various cognitive challenges. As such, this dual approach could pave the way for innovative strategies in cognitive enhancement and therapeutic interventions. Mindfulness enhances awareness of the present moment, enabling athletes to effectively cope with stress and enhance their focus. Concurrently, techniques for brain stimulation have the potential to improve neural efficiency and bolster resilience in the face of fatigue. This subject delves into creative approaches aimed at enhancing cognitive performance, thereby assisting sprint athletes in reaching their highest capabilities. This research aimed to investigate the effectiveness of a mindfulness training course - transcranial direct current stimulation- on the mental fatigue of female sprinters. The domain of compound training for sprinters has not been extensively researched, especially considering that recent findings have demonstrated the effectiveness of brain stimulation in mitigating mental fatigue and boosting the performance of professional athletes.

Methods : This research employed a semi-experimental methodology for data collection, utilizing a pre-test-post-test design alongside a sham group. The statistical population encompassed all sprinters within the country, while the sample consisted of two groups, each comprising 10 sprinters, selected from the available population. The research tools are Smets et al.'s Fatigue Measurement Questionnaire (MFI) and Mood Scale (POMS). In order to summarize, classify, and test the normality of the data, descriptive statistics were used and the Shapiro-Wilk test and covariance analysis were used to analyze the data.

Results : The findings of the research showed that there is a significant difference between the mean of the experimental group and the sham group. Therefore, the research hypothesis was confirmed ($P<0.05$). Therefore, it can be said that the simultaneous combined training protocol has an effect on mental fatigue ($P<0.05$). Analysis of the research outcomes reveals that the scores from the Fatigue Measurement Questionnaire (MFI) and the Mood Scale (POMS) were not only positive but also statistically significant, making them suitable for use ($P<0.05$).

Conclusion : Additionally, the outcomes derived from the covariance analysis demonstrate that the null hypothesis is not upheld, as supported by Khalaf's findings, with a significance level of $P<0.05$. The data reveal that the combination of mindfulness exercises and brain stimulation yields a positive and significant effect on the mental fatigue of sprinters. Overall, it can be concluded that a training program that merges movement and stimulation has a notable impact on the mental fatigue of sprinters.

Keywords : sprinters; mental fatigue; brain stimulation; mindfulness

Count: 133
Abstract ID: 538
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Major Depressive Disorder Diagnosis Using EEG Signal Processing and Machine Learning Approach

Submission Author: Alireza Fallahi

Alireza Fallahi[1], Ramin Aghili Karampour[2], Ebrahim Vahdani [3], Seyed Parsa Saleh[4]

1. Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran
2. Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran
3. Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran
4. Biomedical Engineering Department, Hamedan University of Technology, Hamedan, Iran

Background and Aim : Major depressive disorder (MDD) is a serious mental disorder associated with a wide range of symptoms, including persistent feelings of sadness and decreased motivation. This disease can affect a person's quality of life and cause problems in work, social relationships, and daily functioning. Diagnosis of MDD is usually made through clinical evaluations and psychological questionnaires, but a more accurate diagnosis is possible using advanced tools such as electroencephalogram (EEG) and brain imaging. These tools help researchers and neurologists identify abnormal patterns of brain activity and provide more effective treatments. Treatment for MDD typically involves a combination of medications, psychological therapies, and lifestyle changes aimed at improving symptoms and increasing quality of life.

Methods : In this study, the EEG dataset includes 36 subjects: 16 healthy controls (HC) and 20 MDD patients which were diagnosed using the Beck Depression Inventory (BDI), have been used. EEGLAB software, developed based on MATLAB, was used to process the EEG signals. The preprocessing steps included removing noises caused by eye movements, muscle activity, and electrical interference, as well as low- and high-frequency removal using a digital filter. Independent Component Analysis (ICA) and Artifact Subspace Reconstruction (ASR) were utilized to identify and remove internal noise. After data preprocessing, relevant features indicating brain activity differences between HC and MDD subjects were extracted from the EEG signal. We used the power of frequency bands (theta, alpha, and beta) and hemispheric asymmetry characteristics as features. These features were then fed into machine learning models such as SVM and KNN to classify HC and MDD subjects

Results : The results of classification using cerebral hemisphere asymmetry in different frequency bands indicated in the theta frequency band, the accuracy of the model is 64.4%. In the alpha band, the classification accuracy increased to 65.78%. In the beta band, the highest accuracy was obtained with a value of 79.69%. Also, by combining all frequency bands, the final classification accuracy reached 75.19%. These results indicate that the beta band plays a more crucial role in diagnosing MDD and using all frequency bands can provide acceptable accuracy.

Conclusion : The results demonstrate that features extracted from EEG signals, especially the asymmetry of brain hemispheres in frequency bands, are effective tools for diagnosing major depression. The beta band, with an accuracy of 79.69%, has the most impact on diagnosis, and the combination of bands has also provided acceptable accuracy. This non-invasive and fast method can be an alternative to expensive methods such as fMRI and can be used in clinical settings for a more accurate diagnosis of depression.

Keywords : EEG Signals; Signal Processing; Machine Learning; MMD

Count: 134
Abstract ID: 746
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Advancing Neuropsychiatric Disorder Treatment Through Toll-Like Receptor Research: From Laboratory Insights to Clinical Application

Submission Author: Rahil Mostofi

Rahil Mostofi[1], Mohammad Saleh Safari[2]

1. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.
2. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.

Conclusion : Introduction: Toll-like receptors (TLRs) play a crucial role in the immune response by detecting pathogen-associated molecular patterns. Recent research links TLRs to neuropsychiatric disorders, such as depression, anxiety, schizophrenia, and Alzheimer's disease, due to their role in neuroinflammation and neural signaling. This review examines current findings on TLR-mediated pathways in the central nervous system and their impact on neuropsychiatric symptoms. Methods: This study is a review study by searching scientific databases such as Scopus, PubMed, and Embase from 2016 to 2024 by using the keywords Toll like receptors, Neuropsychiatric Disorder, Neuroscience, 67 articles related to inclusion criteria were extracted and Studies assessing TLR expression in animal models and human patients, as well as clinical findings correlating TLR levels with neuropsychiatric symptoms, were analyzed. Therapeutic approaches targeting TLRs were also reviewed. Results: Findings indicate heightened TLR activation in neuropsychiatric conditions, with inflammation-driven pathways affecting neurotransmitter systems and synaptic plasticity. Additionally, animal models reveal that blocking TLRs reduces inflammation and alleviates certain neuropsychiatric symptoms. Discussion: TLRs hold potential as therapeutic targets for neuropsychiatric disorders, yet challenges remain in translating animal research to effective treatments for human patients. Moving forward, understanding TLR-related signaling pathways may improve interventions, offering hope for precise, immune-modulating therapies in neuropsychiatric care.

Keywords : Toll like receptors, Neuropsychiatric Disorder, Neuroscience.

Count: 135
Abstract ID: 584
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

The role of dopamine in personality disorders with a focus on dependent personality disorder

Submission Author: Yeganeh Farnamian

Yeganeh Farnamian[1]

1. Student Research Center, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

Conclusion : Dependent Personality Disorder (DPD) is marked by an excessive need for care, leading to submissive and clingy behaviors. Recent research highlights the role of dopaminergic pathways in the development and maintenance of DPD symptoms. Dopamine, a neurotransmitter linked to reward and motivation, significantly influences social behaviors and attachment mechanisms. Individuals with DPD often demonstrate increased sensitivity to social feedback and a profound fear of abandonment—factors that may be associated with altered dopamine signaling. This paper reviews emerging evidence that links dopamine dysregulation to the attachment styles commonly observed in DPD, suggesting that dysfunction within the mesolimbic pathway may intensify feelings of inadequacy and dependency. By examining the interplay between dopamine and personality traits in DPD, this study aims to enhance therapeutic strategies, promoting targeted interventions that focus on restoring neurochemical balance and fostering healthier relational dynamics.

Keywords : Dopamine, Dependent personality disorder, dopaminergic pathways

Count: 136
Abstract ID: 672
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

The effect of fluoxetine treatment on Lysolecithin-induced neurotoxicity in male rats on the expression of Kir4.1 and AQP4 genes

Submission Author: FATEMEH DALVAND

FATEMEH DALVAND[1], ashkan ansary[2], elham gholami[3], Aboulfazl Jabarpour[4], mahbobeh sahlabadi[5], amir salehitaleghani[6], Mojtaba Khaksarian[7], Masoumeh Sefidgari[8], Anahita Momeni[9]

1. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.
2. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.
3. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences.
4. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences.
5. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
6. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
7. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences
8. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
9. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.

Background and Aim : Introduction: Multiple sclerosis(MS) is a demyelinated disease of the central nervous system (CNS), and there is evidence that environmental and genetic factors play a role in its development. The most important defect in MS is demyelination. Various models including(EAE), lipopolysaccharide, ethidium bromide, cuprizone, and Lysolecithin (LPC) are used to study demyelination. In this study, LPC toxin was used to induce demyelination in male rats LPC and LPC were treated with fluoxetine intraperitoneally and daily. To create a suitable demyelinating model, investigate the effect of fluoxetine treatment in the model on inward rectifying potassium channel (Kir4.1) and aquaporin 4(AQP4) genes.

Methods : In this study, 36 male Wistar rats weighing 180-160 g were divided into 6 groups: control group, LPC model group, and LPC model groups treated with fluoxetine at doses of 5 and 10 mg/kg per day for one and Four weeks.

Results : In this study, the results of the gene study showed that the expression of AQP4 and Kir4.1 genes in the fluoxetine-treated LPC model group was significantly reduced compared to the control group.

Conclusion : The results of this study showed the beneficial effect of fluoxetine treatment on the expression of Kir4.1 and AQP4 genes. However, further studies are needed to detail its mechanisms.

Keywords : fluoxetine, demyelination, lysolecithin, Kir4.1, AQP4

Count: 137
Abstract ID: 663
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

The Neurobiological Underpinnings of Chronic Stress-Induced Hippocampal Dysfunction: Implications for Cognitive Impairment and Mental Health

Submission Author: Fatemeh TaleshiDoulatRoudbar

Fatemeh TaleshiDoulatRoudbar[1]

1. Master of Clinical Psychology, Islamic Azad University, Sari Branch, Babol, Iran

Conclusion : Introduction Chronic stress has become a major public health concern, with stress disorders affecting nearly one-eighth of the global population. As the understanding of the impact of psychological stress on the brain evolves, chronic stress is increasingly recognized as a significant risk factor for hippocampal dysfunction. Dysregulation of hippocampal activity and heightened cortisol levels are commonly observed in individuals exposed to chronic stress. Within the general population, there are notable interindividual differences in cortisol sensitivity and stress response, making certain individuals more vulnerable to the detrimental effects of chronic stress. The hippocampus, a critical brain region for memory formation and emotional regulation, is particularly affected by chronic stress. This can result in reduced hippocampal volume and memory problems, often observed in stress-related disorders such as depression and PTSD. Adolescents exposed to chronic stress during developmental stages are the most susceptible to stress-induced disease and long-term cognitive impairments. Moreover, evidence suggests that a history of chronic stress is also linked to cognitive decline and an increased risk for dementia, with females being at a higher risk than their male counterparts. The interplay between sex and stress history indicates that specific mechanisms may underlie neural dysfunction across the lifespan. The response of sex and stress steroid receptors in the hippocampus provides a potential locus for these variables to drive changes in cognitive function. This is further complicated by the increased vulnerability of the adolescent brain to stress-induced changes in neural circuitry, which can exacerbate the risk for psychiatric disease. The goal of this review is to provide a comprehensive synthesis of the existing literature examining the environmental and genetic factors that contribute to the impact of chronic stress on hippocampal function, emphasizing the interplay between external influences and individual predispositions in the development of stress-related disorders and cognitive impairments. Method This study employed a systematic review-analytical method to examine the existing body of literature on the effects of chronic stress on hippocampal function. The review aimed to synthesize findings from relevant research articles to better understand the relationship between chronic stress and hippocampal function. Results Overall, the results of this systematic review indicate that chronic stress can negatively impact hippocampal function, leading to structural and functional alterations that contribute to memory impairments and other cognitive deficits. The findings highlight the importance of addressing chronic stress and developing interventions to mitigate its detrimental effects on hippocampal function and mental health. Conclusion The findings consistently demonstrate that stress disorders and mood

anxiety disorders are associated with reduced hippocampal volume and decreased activity in this critical brain region. These changes in the hippocampus can lead to memory and learning impairments, significantly impacting individuals' daily lives and increasing the risk for cognitive decline and dementia in the future. These observations underscore the importance of recognizing the potential long-term consequences of chronic stress and mood disorders on brain function and overall well-being.

Keywords : Chronic Stress, Hippocampal Dysfunction, Cognitive Impairment

Count: 138
Abstract ID: 604
subject: Neuropsychiatry and Psychology: Other
Presentation Type: Poster

Life stressors and personality traits in ischemic cerebral infarction

Submission Author: Mahsa Baghbani

Mahsa Baghbani[1], Shahid Sadoughi University of Medical Sciences[2]

1. Department of Psychology, Yazd Branch, Islamic Azad University, Yazd, Iran

Background and Aim : Cerebral Stroke, known as one of the most common causes of mortality and morbidity worldwide. The frequency of stroke is rising by ageing the population and placed a significant concern for public health. However, modifying risk factors contributing to stroke may decrease the burden of the disease. This study aimed to examine the association of life stressors and personality types with stroke.

Methods : The participants were a convenient clinical sample of 100 patients with ischemic stroke and 100 individuals without stroke. The Paykel life event questionnaire and Friedman and Rosenman personality type questionnaire were used to evaluate life stressor and personality characteristics, respectively.

Results : Among the different types of stressor subgroups, mean prevalence score of total life stressors, psycho-social stressors, frustration-despair stressors and mental-physical stressors were significantly higher in patients ($p=0.001$, $p<0.001$, $p=0.001$, and $p<0.001$ respectively). The prevalence of type A personality in stroke patients and control group were 52 and 45 %, respectively ($p = 0.322$). Severity scores of stressors were often higher in cerebral infarction patients with type A personality.

Conclusion : There is an association between higher psychological stressors and stroke, and persons with type A personality in both groups experienced more stress than type B. It suggests that cerebral infarction patients with type A personality have a higher level of stress in response to life events which could consider as a modifiable factor.

Keywords : Life stressors; Personality traits; Ischemic cerebral infarction

Count: 139
Abstract ID: 633
subject: Neuropsychiatry and Psychology: PTSD
Presentation Type: Poster

Impact of Anxiety on Attention in Post-Traumatic Stress Disorder: A Systematic Review from 2015 to 2024

Submission Author: Parisa Ghafourian

Parisa Ghafourian[1], Shokoufeh Moezzi[2]

1. ghafourianpari@gmail.com
2. shokoufeh.moezzi.94@gmail.com

Conclusion : Background: Post-traumatic stress disorder (PTSD) is a complex psychological condition arising from traumatic experiences, leading to intrusive symptoms, avoidance, and mood alterations. These distressing symptoms can profoundly affect a person's quality of life. Anxiety, a core component of PTSD, has been implicated in attentional impairments in affected individuals, which can be shown in daily life. Aims: This systematic review aims to investigate the effects of anxiety on attention in individuals with PTSD and explore potential interventions to improve their quality of life and facilitate their return to normal functioning. It is undeniable that a lack of attention can influence the efficacy of people in working and studying. So in general, people may lose their self-confidence in social activities. This review's main goal is to find the relationship between anxiety and attention in PTSD people to improve their attention. Materials and Methods: A systematic literature search was conducted on Google Scholar, PubMed, and Science Direct databases, encompassing 2010 to 2024. Studies exploring the impact of anxiety on attentional performance in individuals with PTSD were included. The results of them are compared to each other and the final results are investigated. Findings: Research indicates that people with PTSD frequently experience attentional deficits and difficulties in information processing. A strong association between anxiety and impaired attention has been observed, suggesting that anxiety may play a pivotal role in exacerbating these cognitive impairments, so by decreasing the level of anxiety we can help people who suffer from PTSD to enhance their attention. Discussion and Conclusion: Anxiety appears to be a critical factor contributing to attentional difficulties in individuals with PTSD, causing significant functional limitations. Evidence suggests an inverse relationship between anxiety and attention in this population. Consequently, interventions targeting anxiety reduction may prove beneficial in improving attentional abilities and overall quality of life, ultimately aiding their return to normal life. It is because when PTSD people are in a risky situation that reminds their trauma, they feel anxious and they are distracted from whatever they want to focus. Therefore, if we can manage their anxiety, their attention will not be distracted. Future research should focus on developing and testing anxiety-based interventions for individuals with PTSD to alleviate attentional deficits and enhance their daily functioning.

Keywords : Post-traumatic stress disorder; Anxiety; Attention

Count: 140
Abstract ID: 315
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Neurotransmitters and Signaling Molecules
Presentation Type: Oral

Diverse Behavioral Responses of astrocytes from Different Brain Locations of Epileptic Patients to Small Molecules

Submission Author: Javad Momeni

Javad Momeni[1], Ali Gorji[2], Elham Hosseini[3], Sajad Sahab Negah[4]

1. Department of Neuroscience, Faculty of Medicine, 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

Background and Aim : The role of glial cells in developing epilepsy has garnered significant attention. Suppressing astrogliosis is a crucial target for creating a more favorable environment in epilepsy tissue.

Methods : To explore this, we investigated the effects of specific small molecules on the survival of astrocytes obtained from drug-resistant epileptic patients. Our study focused on the impact of three small molecules – Valproate, Forskolin, and GSK3 inhibitor/WNT activator (referred to as CHIR99021) – on the viability of these cells derived from temporal lobe resection tissues obtained post-surgery from six patients. Following the primary culture and expansion of cells, twelve groups were exposed to different small molecules and cell viability was evaluated using the MTT assay.

Results : Our findings indicate that specific small molecules, whether used alone or in combination with others, can impact the survival of astrocytes. The response varies depending on the cell source and the individual patient. Notably, astrocytes sourced from the amygdala of two patients showed increased sensitivity to the small molecules. In contrast, astrocytes from the cortex exhibited decreased viability in only one patient group (CHIR+VPA). Interestingly, astrocytes from the hippocampus showed a notable decrease in viability in one patient across all groups, while another showed no significant changes.

Conclusion : In conclusion, our findings underscore the potential of personalized treatments for drug-resistant epilepsy. The diverse responses of astrocytes to small molecules, based on the patient's characteristics and brain locations, highlight the need for individualized approaches. This research could inspire new strategies and treatments, motivating us to continue our efforts in the fight against epilepsy.

Keywords : Small Molecule, Astrocyte, Epilepsy, Survival, Cell Proliferation

Count: 141
Abstract ID: 16
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Channels, Receptors, Transporters,
Presentation Type: Poster

The modulatory effect of exercise on the endocannabinoid signaling pathway in the epileptic rats

Submission Author: Fariba Karimzadeh

Fariba Karimzadeh[1], Asal Salimi[2], Mansoureh Soleimani[3]

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.

Background and Aim : Introduction: Regular moderate exercise and endogenous cannabinoid activity independently have been shown to alleviate seizure attacks. We aimed to investigate the effect of physical activity on the level of cannabinoid CB1 and CB2 receptors expression in the brains of epileptic rats.

Methods : Method: Male Wistar rats were split into five groups, including sham, seizure (SE), Physical activity (PA), PA+SE, and PA before SE. Epileptic seizures were induced by pentylenetetrazol (PTZ; ip, 35 mg/kg) every other day for four weeks in the SE, PA+SE, and PA before SE groups. Animals in the (PA), PA+SE, and PA before SE groups experienced running on a treadmill (30 min per day for five days a week). The mean number of cortical and hippocampal (CA1, CA3) reacted CB1 and CB2 receptors was assessed using immunohistochemistry.

Results : Results: This study data showed a considerable reduction of CB1 and CB2 receptors in the CA1, CA3, and cortex of the SE group compared to the sham. CB1 receptor significantly increased in the PA and PA before SE groups compared to the seizure group in both cortical and hippocampal areas. Physical activity significantly increased hippocampal and cortical CB2 distribution in the PA, PA + SE, and PA before SE groups compared to the SE group.

Conclusion : Conclusion: Our findings suggested exercise on the expression modulated the hippocampal and cortical cannabinoid receptors in the epileptic rats. These findings highlighted the involvement of the endocannabinoid pathway in the anti-epileptic effect of exercise.

Keywords : Cannabinoid receptors, Epilepsy, Exercise, Hippocampus, Cortex

Count: 142
Abstract ID: 17
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Channels, Receptors, Transporters,
Presentation Type: Poster

The effect of different patterns of intermittent fasting diet on the convulsive behaviors: the possible role of glutamic acid decarboxylase enhancement

Submission Author: Fariba Karimzadeh

Fariba Karimzadeh[1]

1. Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Intermittent fasting diet (IFD) has been known as a supplementary therapy for epilepsy. The main mechanisms involved in the anti-epileptic effect of IFD have not been well understood. This study has investigated the effect of IFD on hippocampal glutamic acid decarboxylase enzyme (GAD65) expression as a critical enzyme to fast modulation of GABA level.

Methods : Male adult rats were divided into 4 groups of sham, seizure, fasting & seizure, and pre-seizure fasting. Seizures were induced by pentylenetetrazol (PTZ) injection every other day for 4 weeks. The protocol of IFD was alternate-day feeding (24 hours of access to food every 48). In the pre-seizure fasting group, rats were put on the alternate-day feeding schedule for weeks 1–8 and PTZ was injected every other day in weeks 5–8. Hippocampal level and distribution of GAD65 have evaluated using western blotting and immunofluorescence analysis respectively.

Results : Study findings revealed a significant reduction of seizure behavior scores in the pre-seizure fasting group on days 10, 16, 20, and 22. In the CA3 area, expression of GAD65 decreased in the seizure group compared to the sham group. In the CA1 area, expression of GAD65 increased significantly in both fasting groups compared to the seizure group. Moreover, the hippocampal protein level of GAD65 increased significantly in both fasting groups compared to the seizure group.

Conclusion : The IFD before seizure induction has more potential to modulate the development of seizure behaviors, compared to IFD simultaneously with seizure.

Keywords : GAD65, Caloric restriction, Hippocampus, Seizure, GABA, Pentylenetetrazol

Count: 143
Abstract ID: 356
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

Dopamine D2-like receptors mitigate impairment in short-term synaptic plasticity in PTZ-kindled rats

Submission Author: Maryam Sharifi

Maryam Sharifi[1], Shahrbanoo Oryan [2], Alireza Komaki [3], Javad Mirnajafi-Zadeh [4], Abdolrahman Sarihi [5]

1. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Animal Biology, Faculty of Biological Science, Kharazmi University, Tehran, Iran
3. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
5. Department of Neuroscience, School of Sciences and Advanced Technology in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : PTZ kindling induces a wide range of changes across neurochemical, behavioral, and neurophysiological domains, notably affecting synaptic plasticity and impairing learning and memory functions. Synaptic plasticity is modulated by various neuromodulators, with dopamine being a key player. However, the specific role of dopamine D2-like receptors in regulating short-term synaptic plasticity following seizures remains largely unclear.

Methods : Using field potential recording, we explored the effect of dopamine D2-like receptors on short-term synaptic plasticity at three distinct inter-pulse intervals (30 ms, 80 ms, and 160 ms) in the stratum radiatum layer of the dorsal hippocampal CA1 region, in kindled male rats.

Results : Our results demonstrated that activation of dopamine D2-like receptors rescued short-term synaptic plasticity in PTZ-kindled rats.

Conclusion : Taken together, our results highlight the potential for dopamine D2-like receptors in improving short-term synaptic plasticity following seizure.

Keywords : dopamine D2 receptors; synaptic plasticity; seizure; PTZ kindling

Count: 144
Abstract ID: 41
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

The Effects of the Fraction Isolated from Iranian Buthotus shach Scorpion Venom on Synaptic Plasticity, Learning, Memory, and Seizure Susceptibility

Submission Author: Elmira Heidarli

Elmira Heidarli[1], Hossein Vatanpour[2], Nafiseh Nasri Nasrabadi[3], Maha Soltani[4], Saeed Tahmasebi[5], Mehrdad Faizi[6]

1. Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Pharmaceutical Sciences Research Centre, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Department of Cognitive science Islamic Azad University Tehran Science and Research Branch
6. Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Epilepsy, as a neurological disease, can be defined as frequent seizure attacks. Further, it affects many other aspects of patients' mental activities, such as learning and memory. Scorpion venoms have gained notice as compounds with potential antiepileptic properties. Among them, Buthotus schach (BS) is one of the Iranian scorpions studied by Aboutorabi et al., who fractionated, characterized, and tested this compound using electrophysiological techniques in brain slices (patch-clamp recording).

Methods : In the present study, the fraction obtained from gel electrophoresis was investigated through behavioral and electrophysiological assays. At first, ventricular cannulation was performed in rats, and then the active fraction (i.e., F3), carbamazepine, and the vehicle were microinjected into the brain before seizure induction by the subcutaneous (SC) injection of pentylenetetrazol (PTZ). Seizure behaviors were scaled according to Racine stages. Memory and learning were evaluated using the Y-maze and passive avoidance tests. Other groups entered evoked field potential recording after microinjection and seizure induction. Population spike (PS) and field excitatory postsynaptic potential (fEPSP) were measured.

Results : The F3 fraction could prevent the fifth stage and postpone the third stage of seizure compared to the control (carbamazepine) group. There was no significant improvement in memory and learning in the group treated with the F3 fraction. Also, PS amplitude and fEPSP slope increased significantly, and long-term potentiation was successfully formed after the high-frequency stimulation of the performant pathway.

Conclusion : Our results support the antiepileptic effects of the F3 fraction of BS venom, evidenced by behavioral and electrophysiological studies. However, the effects of this fraction on memory and learning were not in the same direction, suggesting the involvement of two different pathways.

Keywords : Epilepsy, Scorpion, Memory, Learning, Synaptic, Plasticity, Field, Recording, Acute, Seizure.

Count: 145
Abstract ID: 159
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Synaptic Transmission and Synaptic Plasticity
Presentation Type: Poster

Effects of morphine exposure on the profile of short- and long-term plasticity at perforant path-dentate granule cell synapses along the longitudinal axis of the hippocampus in male rats

Submission Author: Sohrab AnvariHajimohammadlou

Sohrab AnvariHajimohammadlou[1], Mohammad Javan[2], Javad Mirnajafi-Zadeh[3], Yaghoub Fathollahi[4]

1. Tarbiat modares university
2. Tarbiat modares university
3. Tarbiat modares university
4. Tarbiat modares university

Background and Aim : Purpose/ aim: We aimed to assess the profile of perforant path-dentate granule cell synaptic plasticity along the longitudinal axis of the hippocampus in morphine-tolerant rat.

Methods : Male Wistar rats (180–220 g) were treated with morphine sulfate (10 mg/kg, i.p., once a day for 7 consecutive days), and its analgesic effect was measured by tail-flick test. Paired-pulse and LTP responses at perforant path-dentate granule cell synapses were assessed by field potentials recording from the transverse slices of the dorsal, intermediate and ventral hippocampus of morphine-tolerant rats.

Results : The maximum possible analgesia caused by chronic morphine continuously decreases so that on seventh day had the index value similar to the same day in the saline-injected group, indicating tolerance development to repeating morphine exposure. Synaptic facilitation at perforant path-DG synapses of the ventral hippocampus was observed at IPI of 20 ms in the morphine-tolerant group compared to the control group. The LTP magnitude (%) at perforant path-DG synapses of the intermediate and ventral hippocampus was reduced in the morphine-tolerant group compared to the control group.

Conclusion : Plasticity profile at perforant path-dentate granule cell synapses along the dorso-ventral axis of the hippocampus is differentially affected by repeated morphine, indicating a distinct effect of chronic morphine on information processing in DG along the hippocampal long axis.

Keywords : hippocampus; dentate gyrus; dorso-ventral axis; morphine; synaptic plasticity

Count: 146
Abstract ID: 322
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Gliology (Gliotransmission, Gliogenesis, Neuro-glia Cross Talk)
Presentation Type: Poster

The effect of Brucella abortus on glial activation and cell death in adult male rat's hippocampus

Submission Author: Amirreza Beirami

Amirreza Beirami[1], Mobina Fathi[2], Kimia Vakili[3], Ibrahim Mohammadzadeh[4], Mojtaba Sani[5], Maral Hasanzadeh[6], Yaser Khakpour[7], Saeed Alamian[8], Abbas Aliaghaei[9]

1. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Skull Base Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical sciences, Tehran, Iran
5. SNSI-SaniNeuroSapiens Institute, Hanover, Germany
6. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
7. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
8. Razi Vaccine and Serum Research Institute, Agricultural Research, Education and Extension Organization (AREEO), Karaj, Iran
9. Hearing Disorders Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : This study investigates the impact of B. abortus infection on neurogenesis in the hippocampus of rats, suggesting a decrease in neurogenesis as a potential pathological mechanism in neurobrucellosis. The objective of this study was to assess the correlations between neuroinflammatory and cell death parameters in the hippocampus of rats exposed to Brucella abortus infection.

Methods : The methods used in this study included stereological analysis, histological analysis, and molecular studies. Rats were infected with Brucella abortus, and their hippocampus samples were collected for analysis. Immunohistochemistry was used to detect specific markers for astrocytes and microglia. Western blot analysis was used to detect caspase-3 expression. The study used immunohistochemistry, western blotting, and stereology to examine the effects of Brucella infection on astrocytes, microglia, and neurons in the hippocampus of rats. The study used Ki-67 staining to assess neurogenesis in the dentate gyrus of the hippocampus in rats infected with B. abortus.

Results : The results showed increased microgliosis and astrogliosis in the hippocampus of infected rats, indicating glial activation. Additionally, a high level of caspase-3 was detected, suggesting susceptibility to apoptosis. The expression of Ki67 was decreased, supporting this

finding. Sholl's analysis revealed a significant failure in glial morphology. The results showed that Brucella infection increases astrocyte and microglia proliferation and activation, leads to morphological changes, and induces apoptosis and reduced neurogenesis. The study found a reduction in neurogenesis in the dentate gyrus of the hippocampus in rats infected with B. abortus.

Conclusion : The study demonstrates that Brucella abortus infection can destroy the hippocampus and potentially affect its normal physiology. However, more research is needed to clarify various aspects of neurobrucellosis. The study suggests that Brucella infection can impact the brain, leading to astrogliosis, microgliosis, and apoptosis, and that these changes may contribute to the pathogenesis of neurobrucellosis. The study suggests that a decrease in neurogenesis could serve as a pathological mechanism in neurobrucellosis.

Keywords : Neuroinflammation; Glial activation; Neurobrucellosis; Dark neuron; Hippocampus

Count: 147
Abstract ID: 240
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Applying Model Predictive Control in seizure events for appropriate neurostimulation: a Literature Review Study

Submission Author: Hossein Hassanzadeh Yaghini

Hossein Hassanzadeh Yaghini[1], Fezzeh Hosseinzadeh[2]

1. Faculty of Electrical and Computer Engineering, University of Tabriz, Tabriz, Iran
2. Department of Physiology, Sarab Faculty of Medical Sciences, Sarab, Iran

Background and Aim : Model Predictive Control is a control strategy that utilizes mathematical models to predict future system behavior and optimize control inputs accordingly. Model Predictive Control (MPC) serves as a promising framework for electrical neurostimulation in the treatment of epilepsy, integrating advanced mathematical models with real-time brain activity monitoring. In the context of epilepsy treatment, MPC can predict seizure events by analyzing patterns in brain activity and applying appropriate neurostimulation to mitigate these seizures.

Methods : A systematic search was performed to identify studies published in multiple databases (PubMed, ScienceDirect and Google Scholar) up to 2024

Results : The MPC framework uses a mathematical representation of the brain's electrical activity, enabling the system to modify stimulation parameters based on real-time monitoring adaptively. This allows for a targeted approach to seizure prevention, where the system can respond to irregular brain wave patterns immediately before the onset of a seizure. Research indicates that MPC-based electrical neurostimulation has shown significant efficacy in reducing seizure frequency in various experimental models. The adaptive nature of MPC allows for personalized treatment, where each patient's unique brain activity dynamics are considered in the control strategy. This approach emphasizes enhancing seizure management through dynamic and adaptive stimulation strategies. Future studies can focus on refining the MPC algorithms for electrical neurostimulation and exploring combination therapies with existing neurostimulation methods like vagus nerve stimulation (VNS) and responsive neurostimulation (RNS) to enhance efficacy. This integration could lead to more robust and effective treatments for patients with drug-resistant epilepsy, expanding the clinical utility of MPC in neuromodulation strategies.

Conclusion : MPC's approach predicts future system behavior and optimizes control input to enhance seizure management through dynamic and adaptive stimulation strategies. Therefore, this method can be considered effective for appropriate neurostimulation during seizure events.

Keywords : seizure; neurostimulation; Model Predictive Control

Count: 148
Abstract ID: 577
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Induced Pluripotent Stem (iPS) Cells-Derived Astrocytes: decrease of inflammation in Epilepsy

Submission Author: Elham Zare

Elham Zare[1], Somaye Hesami[2], Seyed Sajjad Alavi Kakhki[3]

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

Conclusion : Epilepsy is a threatening neurological disease that affects approximately 60 million people worldwide. Epilepsy is one of the neurological diseases related to inflammation. Induced pluripotent stem cells (iPS) have the ability to differentiate into the different types of cells, including neurons and glial cells. Astrocytes, as the main glial cells of the central nervous system, play an important role in brain function with the ability to regulate extracellular ions and neurotransmitters, nourish and protect neurons, and modulate the activity of microglia. High activity of microglia can cause brain inflammation and epileptic attacks. The purpose of this article is to investigate the anti-inflammatory effect of astrocytes in the treatment of epilepsy. Astrocytes derived from induced pluripotent stem cells can reduce the occurrence of seizures by reducing neuroinflammation caused by microglia cells, so induced stem cells can be used as cell therapy in epilepsy.

Keywords : Astrocytes, Epilepsy, Microglia, Induced Pluripotent Stem Cells

Count: 149
Abstract ID: 511
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Assessing the Impact of Tolfenamic Acid on Oxidative Stress Markers on Acute Seizures in Male Wistar Rats

Submission Author: SeyedehRomina Lavasani

SeyedehRomina Lavasani[1], Abdolkarim Hosseini[2], Vahid Azizi[3]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
3. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Oxidative stress has been increasingly recognized as a significant factor in the development of seizures. This study aimed to investigate the effects of Tolfenamic acid (TA) on total antioxidant capacity (TAC) and total oxidant status (TOS) in male Wistar rats experiencing acute seizures induced by Pentylenetetrazole (PTZ).

Methods : Twenty-four male Wistar rats (200-250 g) were divided into four groups: a vehicle control group, a PTZ-induced seizure group, and two groups treated with TA at 10 mg/kg and 50 mg/kg, administered before PTZ (60 mg/kg) injection. Serum samples were analyzed for TAC and TOS using spectrophotometric techniques.

Results : The results showed that both doses of TA significantly increased TAC and reduced TOS compared to the control group ($P<0.05$). In contrast, the PTZ group exhibited a decline in TAC and an increase in TOS, highlighting the oxidative stress associated with seizures ($P<0.01$). The findings suggest that TA exerts a neuroprotective effect by enhancing antioxidant defenses and mitigating oxidative damage during acute seizures.

Conclusion : The study underscores the pivotal role of oxidative stress in seizure pathophysiology and implies significant therapeutic implications for TA in managing such conditions. The administration of TA effectively enhanced antioxidant capacity and reduced oxidant status in the context of acute seizures, suggesting its potential to mitigate seizure-related oxidative stress. These results warrant further investigation into the therapeutic potential of TA in managing oxidative stress associated with acute seizures.

Keywords : Total antioxidant capacity; Tolfenamic acid; Seizures; Total oxidation status; Pentylenetetrazole

Count: 150
Abstract ID: 94
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Exosomes as Diagnostic Biomarkers and Therapeutic Agents in Epilepsy: Advancements and Insights

Submission Author: Soniz Javadi

Soniz Javadi[1], Naeimeh Akbari-Gharalari[2], Leila Chodari[3], Narin Biabangard[4]

1. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN
2. Department of Physiology, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.
3. Department of Physiology, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.
4. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN

Conclusion : Exosomes are positioned as crucial biomarkers for epilepsy diagnosis and adaptable tools for therapeutic strategies. Their use in liquid biopsy and engineered delivery systems represents a significant advancement in epilepsy management, potentially improving patient outcomes by overcoming current limitations in drug delivery and resistance.

Keywords : Epilepsy, Exosome, Biomarker, Diagnosis, Treatment.

Count: 151
Abstract ID: 141
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Modulation of Oxidative Stress by Tenoxicam in Pentylenetetrazol-Induced Seizures in male Wistar Rats

Submission Author: Zahra Nazari

Zahra Nazari[1], Solmaz Jamshidi Dolat Abad[2], Bita Amiri Hazaveh[3], Zahra Guilandokht[4], Nasrin Abdollahzadeh[5], Saghi Hakimi Naeini[6], Vahid Azizi[7], Abdolkarim Hosseini[8]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
3. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
4. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
5. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
6. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
7. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
8. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran. ab_hosseini@sbu.ac.ir

Background and Aim : Background: Seizures are characterized by sudden, uncontrolled electrical disturbances in the brain, which can lead to increased neuronal activity and metabolic demand. This heightened activity often results in the overproduction of reactive oxygen species (ROS), leading to oxidative stress. This study investigates the effects of Tenoxicam (TNX), a nonsteroidal anti-inflammatory drug, on total antioxidant capacity (TAC) and total oxidant total oxidant statue (TOS) in male Wistar rats subjected to seizures induced by pentylenetetrazol (PTZ).

Methods : Twenty-four rats were divided into four groups: a control group, a PTZ group, and two PTZ groups receiving different dosages of Tenoxicam (0.6 and 1.2 mg/kg). After 30 min, all animals were challenged with PTZ at a dose of 60 mg/kg I.P. to induce seizures. Following PTZ administration, seizure behavior was observed, and TAC and TOS in serums were measured to evaluate oxidative stress levels.

Results : The TAC of the PTZ group was lower comparing with control group ($P<0.01$). In contrast, the PTZ-induced seizure group exhibited a significant increase in TOS level comparing with control group ($P<0.001$). The group treated with TNX 1.2 showed an improvement in TAC level comparing with PTZ group ($P<0.05$). Also, the group treated with

the dosage of TNX (0.6 and 1.2 mg/kg) demonstrated an even greater decrease in TOS levels compared with the PTZ group (P<0.001).

Conclusion : This study demonstrates that treatment with TNX at dosages of 0.6 mg/kg and 1.2 mg/kg resulted in a dose-dependent improvement in antioxidant levels, with the higher dosage showing a more pronounced effect.

Keywords : Total antioxidant capacity; Tenoxicam; Seizures; Total oxidation stress; Pentylenetetrazol

Count: 152
Abstract ID: 184
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Probiotics retard development of a rapid electrical kindling model of epilepsy

Submission Author: Maedeh Feghhi

Maedeh Feghhi[1], Siamak Beheshti[2], Mohammad Rabbani Khorasgani[3], Nasrin Farjad[4]

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
3. Department of Cell and Molecular Biology and Microbiology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran
4. Department of Cell and Molecular Biology and Microbiology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran

Background and Aim : Epilepsy is a common neurological disorder that rigorously affect life quality of many people worldwide. There is growing interest in the role of intestinal microbiome in brain disorders. A bidirectional communication exist between brain and gut where the brain modulates the gastrointestinal tract, and the gut can affect brain function. Probiotics as living microorganisms are beneficial to humans and animals when adequately administered. In the present work, we evaluated the effect of a probiotic mixture on seizure development using a rapid electrical kindling model of epilepsy.

Methods : Eleven adult male Wistar rats weighing 300 g were allocated into two groups. Animals received a probiotic mixture (FamiLact, Iran) or saline by gavage. Two weeks later, they were stereotaxically implanted with two copper uni-polar electrodes in the skull surface and a steel tri-polar electrode in the basolateral amygdala. Animals underwent a rapid kindling protocol, using six stimulations with 20 min intervals. After showing stages five seizures, the animals were considered full-kindled. The probiotic supplementation or saline were continuously administered to the animals throughout the recovery period and kindling process. Seizure parameters including after-discharge duration, and the number of stimulations required for the development of the kindling were recorded

Results : We found that the probiotic supplementation significantly retarded seizure induction by increase the number of stimulations required for the development of the rapid electrical kindling and shortening after-discharge duration.

Conclusion : Our findings showed positive effect of probiotic bacteria on the retardation of the rapid electrical kindling epileptogenesis. Further investigations are required to unravel the probable involved mechanisms.

Keywords : Probiotics, Seizure, Kindling, Epileptogenesis

Count: 153
Abstract ID: 160
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

The effect of flunixin meglumine on oxidative stress in the experimental model of the seizures

Submission Author: Anahita Abravan

Anahita Abravan[1], Leili Memarzadeh[2], SeyedehRomina Lavasani[3], Sina Amiribesheli[4], Sepideh Saeidinia[5], Armaghan Rahimzade[6], Vahid Azizi[7], Abdolkarim Hosseini[8]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
3. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
4. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
5. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
6. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
7. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
8. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Epilepsy is a neurological disorder characterized by recurrent seizures, with its etiology largely unknown. Seizures are associated with increased oxidative stress and a decrease in antioxidant defenses, contributing to neuronal damage. This study investigates the effect of flunixin meglumine (FM) on seizures induced by pentylenetetrazol (PTZ) in male Wistar rats, focusing on the oxidative stress markers total antioxidant capacity (TAC) and total oxidant statue (TOS).

Methods : In this experimental study, 24 male Wistar rats (200-250 g, 8 weeks old) were randomly divided into four groups of six. The treatment groups received FM at doses of 1.1 mg/kg and 2.2 mg/kg via intraperitoneal (I.P.) injection, while the control and PTZ groups were administered physiological saline. After 30 min, all animals were challenged with PTZ at a dose of 60 mg/kg I.P. to induce seizures. Following PTZ administration, seizure behavior was observed, and TAC and TOC in serums were measured to evaluate oxidative stress levels.

Results : The results demonstrated that FM administration significantly increased TAC ($P < 0.05$) and decreased TOS ($P < 0.05$) compared to the PTZ group, indicating an enhancement in the antioxidant defense system and a reduction in oxidative stress.

Conclusion : These findings suggest that FM has a potential neuroprotective effect against PTZ-induced seizures, likely mediated through its antioxidative properties. Further research is warranted to elucidate the underlying mechanisms and explore the therapeutic potential of FM in epilepsy management.

Keywords : Flunixin meglumine; Total antioxidant capacity; Tolal oxidant statue; Pentylenetetrazol; Seizure

Count: 154
Abstract ID: 181
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Mefenamic Acid mitigates nuclear factor kappa B gene expression level in the male Wistar rats' model of the seizures

Submission Author: Fateme Meraji

Fateme Meraji[1], Hasan Rajabi Maham[2], Vahid Azizi[3], Abdolkarim Hosseini[4]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
3. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
4. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.

Background and Aim : Epilepsy is a neurological disorder marked by recurrent and spontaneous seizures, loss of consciousness, and sensory disturbances. Inflammation plays a significant role in epileptogenesis by modulating oxidative stress, activating microglia, and producing pro-inflammatory cytokines in the brain. Mefenamic Acid(MFA) is a nonsteroidal anti-inflammatory drug(NSAID) used to treat pain, including menstrual pain. It inhibits the activity of the enzymes Cyclooxygenase-1 and Cyclooxygenase-2 by binding to their prostaglandin receptors, which are significant in inflammatory processes, fever, and pain. This study aims to investigate the anti-inflammatory effects of Mefenamic Acid in rats with pentylenetetrazol(PTZ)-induced seizures.
Methods : The total of 24 male Wistar rats were randomly assigned to four groups: a control group, a PTZ group and the MFA treatment groups. Seizures were induced via intraperitoneal injection of PTZ in groups. The MFA group received an intraperitoneal injection of MFA(dosage: 10 and 20 mg/kg) 30 min prior to PTZ administration. Brain tissues were collected post-seizure induction for analysis. The nuclear factor-kappa B(NF-κB) expression were quantified using Real-Time PCR.
Results : The PTZ group, which did not receive MFA, demonstrated a pronounced inflammatory response, characterized by significantly elevated NF-?B expression compared to the control group($P<0.05$). In contrast, animals administered MFA exhibited a marked attenuation of NF-?B expression, indicating a considerable reduction in neuroinflammatory activity relative to the PTZ group($P<0.01$).
Conclusion : This study shows that MFA significantly lowers NF-κB expression and neuroinflammation in rats with PTZ-induced seizures, indicating its potential as a neuroprotective agent. By reducing the inflammatory response, MFA may aid in minimizing neuronal damage caused by seizures.
Keywords : Nonsteroidal anti-inflammatory drug; Mefenamic Acid; Seizures

Count: 155
Abstract ID: 133
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Ferulic acid effects on hippocampal nitric oxide and oxidative stress indices in the kainic acid-induced seizure in mice

Submission Author: Taheri Taheri

Taheri Taheri[1], Majid Hassanpourezatti[2]

1. PhD student in department of Biology, Basic Sciences School, Shahed University, Tehran, Iran
2. Assistant professor in department of Biology, Basic Sciences School, Shahed University, Tehran, Iran

Background and Aim : Ferulic acid (FA) is a phenolic substance with antioxidative and neuroprotective properties. The present study aim is investigating the FA pretreatment effect on kainic acid (KA) status epilepticus model and assessment of hippocampal nitric oxide (NO) and total antioxidant capacity (TAC) in the KA-induced seizure mice.

Methods : In this experimental study, 60 mice (25-30 g) were divided and treated as follow: (1) control group, received distilled water intraperitoneal (I.P) (1 ml/kg body weight) once daily. (2) KA group, given a single dose of (10 mg/kg, i.p). (3), and (4) FA groups received FA (20 and 80 mg/kg, i.p. once a day for 7 days). (5), and (6) seizure preventing groups were treated by KA (10 mg/kg, i.p.) + FA (20 or 80 mg/kg i.p) for 7 days. Mice responses to KA-induced seizure were recorded up to 2 hours after KA injection. The levels of NO and TAC were determined in the hippocampus.

Results : Pretreatment with FA significantly ($p<0.01$) suppressed the KA-induced behaviors like temporal lobe epilepsy. Further, it could protect from brain against KA-induced increase of hippocampus NO levels, and decrease of antioxidant capacity of mice.

Conclusion : The FA administrations can prevent from KA model of status epilepticus in mice by regulating NO and TAC levels in the hippocampus, therefore it suggested as anticonvulsant adjuvants with neuroprotective action against temporal lobe epilepsy.

Keywords : Ferulic acid, Epilepsy, Kainic acid, Oxidative stress, Mice

Count: 156
Abstract ID: 7
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

The Neuroprotective effects of astaxanthin supplement against epilepsy in pregnancy period - a review

Submission Author: Fatemeh BagheriTadi

Fatemeh BagheriTadi[1], Fariba Karimzadeh[2]

1. Department of Anatomy,School of Medicine, Iran University of medical Sciences ,Tehran , Iran
2. Cellular & Molecular Research Center, Iran University of Medical sciences, Tehran, Iran

Conclusion : Astaxanthin(AXT) may be a xanthophyll carotenoid found in various microorganisms and marine creatures . It may be a red fat-soluble shade that has no provitamin A action within the human body, in spite of the fact that a few thinks about have detailed that AXT has more grounded natural action than other carotenoids. The natural sources of AXT are algae, yeast, salmon, trout, krill, shrimp and crayfish and It also has a synthetic source that can be made in laboratory conditions. AXT is a potent antioxidant with anti-inflammatory activity and its effect examined in both experimental animals and human subjects. Also AXT confers multiple neuroprotective effects in various experimental models of neurological diseases, which includes both acute injuries and chronic neurodegenerative disorders. According to studies, it has been determined that neurological diseases, especially epilepsy and stroke, are common causes of death in pregnant women. Preexisting disorders such as epilepsy may worsen in one-third of pregnant patients, and seizures are common during labor. AXT inhibits inflammatory processes in seizures to prevent nerve damage. Therefore, astaxanthin may be beneficial for maintaining brain health. In this review, we intend to evaluate the effectiveness of staxanthin against epilepsy during pregnancy.

Keywords : Astaxanthin, Neuroprotective effects ,epilepsy, pregnancy

Count: 157
Abstract ID: 724
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Assessment of treatment errors in pediatric patients hospitalized for status epilepticus

Submission Author: Fatemeh Rasouli

Fatemeh Rasouli[1], Seyed Hesam Hojjat[2], meisam babaei[3]

1. Student Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Student Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
3. Pediatric Neurology Department, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Introduction: Addressing status epilepticus promptly is crucial to prevent complications in this medical emergency. Current guidelines advocate a systematic three-step strategy involving initial administration of benzodiazepines, followed by the use of long-acting anticonvulsants. General anesthesia is recommended if seizures persist. Objectives: This study aims to pinpoint deficiencies in the management of refractory seizures among children under 18, admitted to Imam Ali Hospital in Bojnord, Iran, from 2021 to 2022.

Methods : Methods: A retrospective cross-sectional analysis was conducted, involving a comprehensive review of medical records for all children under 18 with status epilepticus hospitalized during the specified period. A checklist was utilized to gather data on demographics, clinical parameters, diagnostic tests, medications, and outcomes. The hospital's management practices were compared against the guidelines of the American Epilepsy Society.

Results : Results: A total of 35 patients were included in the analysis. More than 50% received insufficient drug doses, and diagnostic lumbar punctures were infrequently performed. A majority of patients did not receive pre-hospital benzodiazepine. Infections were identified as potential triggers for seizures. Neurological and metabolic conditions predisposed individuals to status epilepticus. While hospital staff promptly managed seizures, outcomes were impacted by non-compliance, fever, and infections.

Conclusion : Conclusion: This study revealed significant gaps in the diagnosis, aggressive treatment, and personalized management of status epilepticus in the studied population. Timely diagnosis and treatment of infectious diseases were identified as critical factors. The study highlighted the importance of multi-disciplinary teams and staff training for timely pre-hospital interventions, improving compliance, and educating about warning signs. Enhanced diagnostics, protocols, and personalized approaches are imperative for more effective management of status epilepticus within local healthcare settings.

Keywords : Keywords: status epilepticus, medical emergency, benzodiazepines, anticonvulsants, general anesthesia,

Count: 158
Abstract ID: 439
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Evaluation of Total Antioxidant Capacity and Total Oxidant Status in Assessing the Effects of Ketoprofen on Acute Seizures in Male Wistar Rats

Submission Author: Saghi HakimiNaeini

Saghi HakimiNaeini[1], Abdolkarim Hosseini[2], Vahid Azizi[3]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
3. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran

Background and Aim : The role of oxidative stress in seizure pathophysiology has garnered attention in recent years. This study aimed to evaluate the effects of ketoprofen on total antioxidant capacity (TAC) and total oxidant status (TOS) in male Wistar rats subjected to acute seizures induced by Pentylenetetrazole (PTZ).

Methods : Twenty male Wistar rats were divided into four groups: a vehicle control group receiving saline twice at 30-minute intervals, a group administered with 60 mg/kg PTZ 30 minutes after saline, and two groups treated with ketoprofen at doses of 1 mg/kg and 10 mg/kg 30 minutes prior to PTZ administration. Serum samples were collected post-treatment to measure TAC and TOS levels using spectrophotometric methods.

Results : The results demonstrated that ketoprofen in the highest dose significantly increased TAC and decreased TOS compared to the PTZ group ($P<0.05$). Conversely, the PTZ group exhibited a significant decrease in TAC ($P<0.01$) and an increase in TOS ($P<0.05$), highlighting the oxidative stress induced by seizures.

Conclusion : Ketoprofen administration effectively improves antioxidant capacity and reduces oxidant status in the context of acute seizures in Wistar rats. These results warrant further investigation into the therapeutic potential of ketoprofen in managing seizure-related oxidative stress.

Keywords : Total antioxidant capacity; Ketoprofen; Seizures; Total oxidation status; Pentylenetetrazol

Count: 159
Abstract ID: 506
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Oral

Trigonelline neuroprotective effects against pentylenetetrazole-induced seizures in rats by targeting inflammation and oxidative stress

Submission Author: Donya Nazarinia

Donya Nazarinia[1], Zana Shahvaysi [2], somayeh vazifehkhah [3]

1. Department of Physiology, School of Medicine, Dezful University of Medical Sciences, Dezful, Iran
2. Student Research Committee, Dezful University of Medical Sciences, Dezful, Iran
3. Department of Basic Sciences, Faculty of Medicine, Sari Branch, Islamic Azad University, Sari, Iran

Background and Aim : Epilepsy has been known to be the most common neurological disorder which inflammation and oxidative stress play a key role in its pathology. Recently, several studies have suggested that trigonelline(TRG) has antioxidant effects. Nevertheless, there is no evidence of its effectiveness against epilepsy. Here, we conducted present study to evaluate its neuroprotective effects against pentylenetetrazole (PTZ)-induced seizures in rats.

Methods : In order to establish the model, the animal intraperitoneally received 45 mg/kg of PTZ for 10 consecutive days. Thirty male rats were randomly assigned into 5 groups as control, PTZ, TRG 50+PTZ, TRG100+PTZ and Valproic acid (VPA) +PTZ. Racine score was used to evaluate seizure parameters. We used ELISA technique to measure the expression of the pro-inflammatory cytokines and total oxidant status(TOS).

Results : Compared to control, significantly higher seizure intensity, TNF-?, IL-1?, and oxidative markers were observed in PTZ-treated rats. TRG at dose of 100mg/kg could alleviate seizure severity and In terms of biochemical assessment, TRG gave rise to a significant decrease in the level of IL-1?, TNF-? and TAS compared to only PTZ group.

Conclusion : our study shows that TRG contains anti-inflammatory and antioxidative effects which contribute to less neuronal damage in in the PTZ-induced seizure rats.

Keywords : Epilepsy, PTZ, rats, Antioxidative, oxidative stress

Count: 160
Abstract ID: 30
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Evaluation of the role of oxidative stress and brain cytokines in the effect of recombinant human interleukin-2 on seizures induced by maximal electroshock in mice

Submission Author: Morteza Fathi

Morteza Fathi[1], Mehrdad Hendabadi[2]

1. Department of Biology, Faculty of Basic Sciences, University of Shahed, Tehran, Iran
2. Department of Biology, Faculty of Basic Sciences, University of Shahed, Tehran, Iran

Background and Aim : Beneficial effects of interleukin-2 on a variety of neurological functions have been reported. Therefore, the effect of recombinant human interleukin-2 (rhIL-2) protein on two parameters of convulsion in maximal electroshock (MES) models, some molecular mediators in mice hippocampus and blood and co-treatment with paroxetine hydrochloride, a serotonin reuptake inhibitor, was investigated.

Methods : One hour after intraperitoneal (i.p.) injection of 5 and 10 (µg/kg) of rhIL-2 to male NMRI mice, latency to onset and duration of hind-legs extension (HLE) were measured following MES exposure. In the combination therapy groups, mice received paroxetine (10 mg/kg) subcutaneously one hour before rhIL-2. Total antioxidant (TAC) and carbonyl proteins (CPs) levels, glutamate dehydrogenase (GDH), myeloperoxidase (MPO) activity in the hippocampus, and also interferon gamma (IFN-γ), thyroxine and CD8 and CD34 markers in the blood by flow cytometry were measured.

Results : Both seizure elements were reduced after injection of 10 (µg/kg) rhIL-2, whereas rhIL-2 at 5 (µg/kg) was only able to reduce the duration of HLE. In addition, pretreatment with rhIL-2 (5 µg/kg) attenuated effect of seizure on hippocampal TAC and CPs levels and inhibited GDH activity. Administration of both doses of rhIL-2 had no significant effect on blood thyroxine and CD markers; while it increased blood IFN-γ levels in convulsive mice. Paroxetine potentiated the effects of rhIL-2 on measured biomarkers in the brain.

Conclusion : Administration of rhIL-2 has beneficial effects on some neuroinflammatory factors and GDH in the brain and blood of mice after exposure to MES-induced seizures, and these effects are enhanced by paroxetine pretreatment.

Keywords : Recombinant Proteins, interleukin-2, tonic-clonic, seizure, antioxidants, glutamate, serotonin

Count: 161
Abstract ID: 317
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Enhanced Seizure control in PTZ-Kindled animals: Synergistic effects of foot electrical stimulation with sodium valproate

Submission Author: Nastaran RoshdRashidi

Nastaran RoshdRashidi[1], Mohammad Reza Palizvan[2]

1. Department Of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran.
2. Department Of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran.

Background and Aim : Previous studies have demonstrated that foot electrical stimulation has the potential to inhibit kindling development but could not prevent seizures in fully kindled rats. The aim of this study is to investigate whether foot electrical stimulation could alter the responsiveness to anticonvulsant drugs in fully kindled animals. In this research, we examine the effect of co-administering foot electrical stimulation at intensity of 0.6 mA with sodium valproate on seizure inhibition in male pentylenetetrazole-kindled rats.

Methods : The standard PTZ kindling model was induced by injecting PTZ (37.5 mg/kg) 13 times at 48-hour intervals. To assess seizure behaviors in animals, their behavior was monitored for up to 20 minutes after the drug injection. After induction of PTZ kindling, the animals were kept under standard conditions for 3 months to allow for epilepsy stabilization. Subsequently, the rats were divided into two groups: control and foot electrical stimulation. Rats in the foot electrical stimulation group underwent 20 minutes of foot electrical stimulation at an intensity of 0.6 mA and a frequency of 3 Hz. Seventy-two hours after the last electrical stimulation session, both groups received sodium valproate at a dose of 200 mg/kg. Thirty minutes later, they were given a single dose of pentylenetetrazol, and their seizure responses were evaluated.

Results : The results of the study indicated that foot electrical stimulation with an intensity of 0.6 mA and a frequency of 3 Hz, combined with sodium valproate, led to significant improvements in seizure-related parameters compared to the control group. Specifically, it resulted in increased stage 2 latency ($p < 0.05$), increased stage 5 latency ($p < 0.05$), and decreased stage 5 duration ($p < 0.05$).

Conclusion : The findings suggest that the adding foot electrical stimulation to the sodium valproate enhances its effectiveness in PTZ kindled animals.

Keywords : PTZ kindling; sodium valproate; Foot Electrical Stimulation

Count: 162
Abstract ID: 572
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Investigating the cognitive aspects of epilepsy

Submission Author: Somaye Hesami

Somaye Hesami[1], Elham Zare[2], Seyed Sajjad Alavi Kakhki[3]

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

Conclusion : Introduction: Epilepsy, a common neurological disorder characterized by recurrent seizures, not only impacts seizure control but also poses a substantial burden on cognitive functioning. Cognitive impairments, including deficits in memory, attention, executive function, and language skills, are prevalent among individuals with epilepsy and can significantly affect daily living and quality of life. This review aims to investigate the cognitive aspects of epilepsy, exploring the nature and extent of cognitive deficits, their underlying mechanisms, and the potential impact of seizure type, duration, and treatment on cognitive outcomes. Materials and Methods: A comprehensive literature search was performed using electronic databases such as PubMed, Scopus, and PsycINFO, covering studies published from 2000 to 2023. The search strategy included keywords such as "epilepsy," "cognition," "cognitive impairment," "neuropsychology," and "seizure type." Studies selected included neuropsychological assessments, longitudinal studies, and meta-analyses examining the cognitive domains affected in epilepsy patients. A total of 75 relevant studies providing insights into cognitive functioning in both adults and children with epilepsy were included in this review. Results: The review found significant cognitive impairments in various domains among individuals with epilepsy. Memory deficits were the most commonly reported, particularly in patients with temporal lobe epilepsy. Attention and executive function were also notably affected, and these deficits appeared to correlate with seizure frequency, duration of epilepsy, and age of onset. Furthermore, the type of antiepileptic drugs (AEDs) used had varying effects on cognition, with certain medications identified as having a more favorable cognitive profile. Discussion: Cognitive impairments in epilepsy can be influenced by several factors, including the underlying neurobiological changes due to recurrent seizures, the impact of AEDs, and the psychosocial consequences of living with epilepsy. For instance, continuous seizure activity may lead to structural brain changes and neuropsychological deficits over time. Moreover, the stigma associated with epilepsy can contribute to cognitive and emotional stress, further exacerbating cognitive decline. Recognizing and addressing cognitive deficits in patients with epilepsy is crucial, as they frequently lead to diminished quality of life and everyday functioning. Conclusion: Cognitive impairments are a significant and often underestimated aspect of epilepsy that require attention in clinical practice. Comprehensive neuropsychological assessment and tailored cognitive rehabilitation interventions should be integrated into epilepsy management. Future research should focus on elucidating the neurobiological mechanisms underlying cognitive deficits, the longitudinal impact of different

treatment approaches, and individualizing care to improve cognitive outcomes in patients with epilepsy.

Keywords : Epilepsy, Cognitive function, Neuropsychology, Cognitive impairment, Neurocognitive assessment

Count: 163
Abstract ID: 573
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Seizure and Epileptic Disorders
Presentation Type: Poster

Evaluation of Depression in Patients with Epilepsy

Submission Author: Somaye Hesami

Somaye Hesami[1], Seyed Sajjad Alavi Kakhki[2], Elham Zare[3]

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

Conclusion : Introduction: Epilepsy is a chronic neurological disorder characterized by recurrent seizures, but it is also frequently associated with comorbid psychiatric conditions, particularly depression. The interplay between epilepsy and depression can significantly impact the quality of life, treatment adherence, and overall management of patients with epilepsy. Understanding the prevalence, risk factors, and implications of depression in this population is crucial for improving clinical outcomes and enhancing therapeutic strategies. This review aims to evaluate the relationship between depression and epilepsy, including assessment methods, prevalence rates, and management approaches. Materials and Methods: A systematic literature search was conducted using databases such as PubMed, Scopus, and Google Scholar, focusing on studies published from 2000 to 2023. Keywords included "epilepsy," "depression," "comorbidity," "assessment tools," and "prevalence." Inclusion criteria encompassed observational studies, randomized controlled trials, and meta-analyses that addressed the evaluation of depression in adults with epilepsy. A total of 60 relevant studies were selected for analysis, highlighting the prevalence rates, assessment methodologies, and treatment outcomes for depressive symptoms in this population. Results: The review revealed that depression is prevalent in patients with epilepsy, with rates reported between 20% and 60%, significantly higher than the general population. Various assessment tools, including the Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDRS), and Patient Health Questionnaire (PHQ-9), were employed to evaluate depressive symptoms. Factors associated with higher depression rates included the frequency and severity of seizures, social stigma, and the presence of other psychiatric disorders. Treatment modalities included pharmacotherapy, psychotherapy, and, in some cases, neuromodulation therapies, with varying degrees of success in alleviating depressive symptoms. Discussion: The co-occurrence of depression and epilepsy is multifaceted, influenced by biological, psychological, and social factors. Biological mechanisms may involve changes in neurotransmitter systems and the impact of seizures on brain networks. Psychological factors, including the stigma related to epilepsy and the unpredictability of seizures, can exacerbate feelings of helplessness and isolation. This comorbidity underscores the necessity of an integrated approach to treatment, where healthcare providers should routinely screen for depression in epilepsy patients and implement appropriate interventions to improve mental health outcomes. Conclusion: Depression is a significant comorbidity in patients with epilepsy, necessitating thorough evaluation and appropriate management to enhance the quality of life and overall treatment efficacy. Clinicians should be aware of the high prevalence of depression in this

population and adopt standardized screening practices. Future research should focus on developing targeted interventions and exploring the underlying mechanisms of depression in epilepsy, ensuring a more holistic approach to patient care.

Keywords : Depression, Epilepsy, Comorbidity, assessment tools, prevalence

Count: 164
Abstract ID: 275
subject: Epilepsy, Neural Excitability, Synapses, and Glia: Other
Presentation Type: Poster

Lack of the expression of liver-expressed antimicrobial peptide-2 in the rat amygdala

Submission Author: Maedeh Jafari

Maedeh Jafari[1], Siamak Beheshti[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 Objective: Liver-expressed antimicrobial peptide-2 is a peptide with antibacterial activity. However, studies have shown that it also acts as the ghrelin receptor type 1a endogenous inverse agonist. Ghrelin receptors exist in different regions of the brain and studies have found the expression of LEAP-2 in some of the same regions of the brain. Yet, its expression was not studied in the rat amygdala as a brain region, which express ghrelin receptors. The aim of our study was assessing the probable expression of LEAP-2 mRNA in the rat amygdala.

Methods: One adult male Wistar rat weighing 300 g was used. The animal was scarified to detach liver (as the positive control) and the right amygdala. The amygdala and liver were immediately frozen in liquid nitrogen and kept in -80ºC freezer. Total RNA was extracted using RNX plus solution. The RNAs were treated with RNase free DNase I to eliminate probable genomic DNA. Then the cDNAs were made using an appropriate cDNA synthesis kit. A PCR reaction using the proper LEAP-2 primers was conducted. The PCR products were run in an agarose gel electrophoresis and stained with a safe stain. The electrophoresed gel was assessed in a gel doc apparatus.

Results: The results showed the expression pf LEAP-2 in the liver as the positive control. We also found the band related to the amplicon thereof, which showed the expression of LEAP-2 mRNA in the rat amygdala.

Conclusion: Our findings indicated for the first time that LEAP-2 exist in the rat amygdala, which might be considered when assessing the ghrelin signaling system in the amygdala.

Keywords: LEAP-2, Amygdala, Rat

Count: 165
Abstract ID: 247
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Investigation of the combined effect of LORETA neurofeedback and tES on Autism Spectrum Disorder: A QEEG-based study

Submission Author: Mahsa Ghaheri

Mahsa Ghaheri[1], Maryam Amini[2], Somayeh Amini[3], Hamid Mirhosseini[4], Fahimeh Mosayebinajad[5], Samira Ghasemi[6]

1. M.A. in Clinical Psychology, Department of Psychology, Najafabad Branch, Islamic Azad University, Najafabad, Iran
2. PhD Student of General Psychology, Department of Psychology, University of Tehran, Kish Branch, Kish, Iran
3. Master of Clinical Psychology, Faculty of Psychology and Educational Sciences, Islamic Azad University of Naein, Isfahan, Iran.
4. Associate Professor, Research Center of Addiction and behavioral sciences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
5. Master of Counseling, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran
6. Master of Psychology Industrial and organizational, Faculty of Psychology and Educational Sciences,Isfahan University,Isfahan, Iran.

Background and Aim : Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder marked by impairments in social communication, restricted interests, and repetitive behaviors, often accompanied by cognitive deficits. Despite the growing prevalence of ASD, current therapies tend to focus on isolated symptoms, lacking integrated approaches that address both cognitive and behavioral dysfunction. Neurofeedback, particularly LORETA neurofeedback (LNFB), has shown promise as a non-invasive technique for modulating brain activity across multiple frequency bands. Similarly, transcranial electrical stimulation (tES) offers another potential intervention by altering cortical excitability and promoting neuroplasticity. This study aims to evaluate the combined effects of LNFB and tES on cognitive and behavioral symptoms in children with ASD, with outcomes measured through brainwave activity, the Child Behavior Checklist (CBCL), and the Stanford-Binet Intelligence Scales (SB).

Methods : This quasi-experimental study included pre- and post-intervention assessments with a control group. Sixteen children and adolescents (ages 6–15) diagnosed ASD were recruited from Rojhan Clinic, Isfahan, and randomly assigned to experimental and control groups. Assessments included EEG-based brain mapping, CBCL, and the Stanford-Binet Intelligence Scales, administered before and after the intervention. The experimental group received a combination of LNFB and tES, tailored according to individual brain maps and clinical profiles. Neurofeedback was administered over 30 sessions (40 minutes each), initially three times a week for 15 sessions, followed by twice-weekly sessions. tES was delivered

concurrently, with intensity and duration adjusted to patient needs. Follow-up assessments were conducted 10 days after completing the interventions.

Results : The combined intervention of LNFB and tES led to improvements in both cognitive and behavioral outcomes in children with ASD. QEEG revealed alterations in brain activity patterns, specifically in regions associated with executive functions. Behavioral assessments, using CBCL, demonstrated reductions in symptoms such as social withdrawal, anxiety, and attention problems. Furthermore, cognitive evaluations through the SB Intelligence Scales indicated enhanced fluid reasoning and visual-spatial skills.

Conclusion : These findings highlight the potential of LNFB and tES as an effective complementary approach for improving executive functions and behavioral regulation in ASD, offering a novel, non-invasive therapeutic avenue for treating core deficits of the disorder.

Keywords : Autism Spectrum Disorder; tES; LORETA neurofeedback; QEEG

Count: 166
Abstract ID: 561
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Electrophysiological predictors of Neurotherapy response in children with ADHD

Submission Author: Mahsa Ghaheri

Mahsa Ghaheri[1], Fahimeh Mosayebinajad[2], Hamid Mirhosseini[3]

1. M.A. in Clinical Psychology, Department of Psychology, Najafabad Branch, Islamic Azad University, Najafabad, Iran..
2. Master of Counseling, Faculty of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran
3. Associate Professor, Research Center of Addiction and behavioral sciences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

Background and Aim : Attention-deficit/hyperactivity disorder (ADHD) is a prevalent neurodevelopmental disorder, affecting between 3-12% of school-aged children globally. It is characterized by symptoms of inattention, hyperactivity, and impulsivity. Although pharmacological treatments, particularly psychostimulants, have shown efficacy in 60–70% of cases, concerns regarding long-term side effects and diminishing efficacy have driven the search for alternative, non-pharmacological interventions. Neurotherapy, including transcranial electrical stimulation (tES) and neurofeedback, has emerged as a promising approach for modulating brain function and alleviating ADHD symptoms. This study retrospectively analyzed electrophysiological markers to identify predictors of neurotherapy response, with the goal of enhancing personalized treatment strategies for ADHD.

Methods : A cross-sectional analysis was performed on EEG data from 25 school-age children diagnosed with ADHD who underwent neurotherapy between 2014 and 2017. EEG recordings were analyzed for changes in theta and beta spectral power, particularly focusing on the frontal lobes. The theta/beta ratio and frontal cordance were explored as potential biomarkers of neurotherapy response. Behavioral outcomes were measured using the Integrated Visual and Auditory (IVA) continuous performance test. Statistical analyses included Pearson correlations and ANOVA to evaluate the association between EEG changes and behavioral improvements.

Results : Responders to neurotherapy exhibited reductions in theta power and improvements in the theta/beta ratio post-treatment, which were associated with increased attentional control and reduced impulsivity. Frontal cordance emerged as a strong predictor of treatment response, indicating its potential utility in guiding personalized neurotherapy interventions for ADHD.

Conclusion : These findings underscore the importance of electrophysiological markers in optimizing treatment strategies. Frontal cordance, in particular, holds promise as a biomarker for predicting neurotherapy response, which could advance the efficacy of personalized interventions for children with ADHD.

Keywords : ADHD; neurotherapy; electrophysiological predictors; frontal cordance

Count: 167
Abstract ID: 327
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

EEG Biomarkers in Personalized Medicine: A New Era in Neurological and Psychiatric Diagnosis

Submission Author: Adrina Habibzadeh

Adrina Habibzadeh[1], Mohammad sadegh Kamran[2]

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

Conclusion : Electroencephalography (EEG) is a widely used, noninvasive technique that measures electrical activity in the brain, offering insights into a range of neurological and psychiatric disorders. As healthcare shifts towards personalized medicine, EEG has become an important tool in patient classification, disease prediction, and the development of individualized treatment strategies. This narrative review aims to explore the role of EEG in personalized medicine, focusing on its utility in identifying biomarkers for various neurological and psychiatric conditions. EEG captures oscillatory brain activity by recording electrical signals from the scalp. These signals reflect the interactions of inhibitory and excitatory postsynaptic potentials in cortical nerve cells (1). The technology has proven crucial in diagnosing brain conditions such as epilepsy (2), brain tumors (3), and post-traumatic stress disorder (4). EEG's ability to detect subtle neural differences allows for the distinction between individuals with normal brain function and those with disorders such as ADHD (5), depression (6), anxiety (7), and autism (8). A key feature of EEG in personalized medicine is its capacity to identify biomarkers. EEG biomarkers, representing distinct variations in brainwave patterns, have been used to distinguish patients from healthy individuals across several conditions. For example, an elevated theta/beta ratio in the frontocentral region is consistently seen in individuals with ADHD (9). Additionally, EEG markers have demonstrated promise in psychiatric disorders, particularly in differentiating patients with major depressive disorder from healthy controls based on oscillatory activity (10). Beyond psychiatric conditions, EEG has also shown potential in pharmaceutical research. It offers valuable insights into drug effects on the Central Nervous System (CNS), providing a noninvasive way to assess pharmacokinetic and pharmacodynamic properties. Studies have highlighted its role in evaluating drug efficacy in conditions such as epilepsy (11) and in predicting anesthetic outcomes (12). EEG's predictive capabilities make it a valuable tool in the development of CNS-targeted therapies, aligning with the goals of personalized medicine. The emergence of personalized medicine, which emphasizes individual differences in disease presentation and response to treatment, necessitates integrating tools like EEG into clinical practice. EEG provides objective measures of brain function that can guide tailored interventions, particularly in neuropsychiatric conditions (13). However, despite its promise, EEG's widespread adoption in clinical settings faces challenges, including the need for standardized protocols for data collection, analysis, and interpretation (14). In conclusion, EEG holds immense potential as a diagnostic and

predictive tool in personalized medicine. Its ability to identify translatable biomarkers paves the way for improved patient outcomes, especially in the early detection and management of neuropsychiatric conditions. As research progresses, further validation of EEG biomarkers could transform drug development and healthcare practices, ultimately advancing personalized approaches to patient care.

Keywords : Personalized Medicine; EEG; Biomarker; Diagnosis; Psychiatric

Count: 168
Abstract ID: 709
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Oral

Glioma theranostics; Where We Stand and Future Directions

Submission Author: Auob Rustamzadeh

Auob Rustamzadeh[1], Farhad Seif[2], Shahram Darabi[3], Enam Gorgich[4]

1. Department of Anatomical Sciences, Faculty of Medicine, Qazvin University of Medical Sciences, Qazvin, Iran
2. Department of Photodynamic Therapy, Medical Laser Research Center, Academic Center for Education, Culture, and Research (ACECR), Tehran, Iran.
3. Cellular and Molecular Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran.
4. Department of Anatomical Sciences, School of Medicine, Iranshahr University of Medical Sciences, Iranshahr, Iran.

Conclusion : Introduction: Glioma arises from glial cells and accounts for about 38.7% of nervous system cancers and 80% of malignant brain tumors. The diagnosis of Glioma is primarily based on the tumor's location and type, which guides treatment options, including surgery, radiation therapy, and chemotherapy, and helps estimate patient survival. Advanced MRI techniques, including diffusion-weighted imaging (DWI), diffusion tensor imaging (DTI), and arterial spin labeling (ASL) perfusion imaging, are crucial for presurgical planning, offering detailed insights into tumor structure and the surrounding brain tissue. Neurobioinformatics, a rapidly advancing field, integrates neuronal data with computational tools, significantly improving our understanding of glioma pathogenesis. MicroRNAs (miRs), small non-coding RNAs, serve as diagnostic, prognostic, and therapeutic targets, potentially revolutionizing glioma detection and treatment strategies. Method: This review summarizes the current state of the art in brain tumor neuroimaging, the role of miRs in glioma pathogenesis, and the discovery of novel inflammatory biomarkers. Results: DTI has been utilized to visualize white matter tracts and evaluate the scope of tumor invasion, offering valuable information about the physiological effects of gliomas on brain connectivity. High perfusion is seen as a result of tumor cell proliferation when the region of interest is connected to the progression of Glioma. In high-grade Glioma compared to paratumorous tissue: oncosuppressor miR-7, miR-31, miR-137, miR-153, miR-181, miR-128, and miR-124 had lower expression levels. Elevated levels of oncogenic miR-23 expression have been found in high-grade Glioma. Immunologic markers including inflammatory cytokines and chemokines further contribute to glioma progression and offer opportunities for targeted therapies. Programmed death-ligand 1 (PD-L1) expression in GBM cells and immune infiltrates is a significant marker for immune evasion, with high PD-L1 levels linked to resistance to immune checkpoint inhibitors (ICIs) and poor prognosis. CTLA-4 and its ligands are also involved in GBM immune escape mechanisms, where the expression of CTLA-4 on T cells and the tumor microenvironment can influence the response to therapies targeting this pathway—the classification and grading of tumors without invasive procedures. Studies have shown that

machine learning (ML) and deep learning (DL) models can reach high levels of precision in diagnosing glioma, with reported accuracies spanning from 79% to 97.7% using different algorithms. These developments enhance the accuracy of glioma diagnosis and assist in evaluating tumor grades non-invasively, which is crucial for deciding on the best treatment approaches. Random Forest (RF) and Support Vector Machines (SVMs), AdaBoost1, and RUSBoost are ML techniques used to segment the brain tumor on FLAIR images. Analysis of an MRI dataset with 3,060 images demonstrated the best results with a 95.10% accuracy, 98.50% specificity, and 95.25% sensitivity for diagnosing brain tumors by combining ML and DL techniques. Conclusion: Neuroimaging techniques like advanced MRI modalities have evolved beyond mere diagnostic tools to become integral components of presurgical planning and treatment monitoring. In conclusion, integrating multi-omic data with advanced bioinformatics tools is essential for developing personalized treatment strategies. Integrating these biomarkers into clinical practice promises to improve patient outcomes through more individualized and effective therapeutic approaches.

Keywords : Neuroimaging; MicroRNAs; Biomarker; Glioms; Deep learning

Count: 169
Abstract ID: 399
subject: Novel and Cutting-Edge Technologies: Brain Mapping (MRI, fMRI, PET, Brain Mapping, EEG, EMG, QEEG, FNIRS)
Presentation Type: Poster

Applications and novel insights of functional optical imaging (fNIRS) in neuropsychological disorders

Submission Author: FATEMEH DALVAND

FATEMEH DALVAND[1], mohammad souri[2], Aboulfazl Jabarpour[3], elahe yarahmadi[4], mahbobeh sahlabadi[5], amir salehitaleghani[6], Mojtaba Khaksarian[7]

1. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.
2. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.
3. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences.
4. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.
5. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
6. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
7. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences

Conclusion : Applications and novel insights of functional optical imaging (fNIRS) in neuropsychological disorders Introduction: Functional near-infrared spectroscopy (fNIRS) has gained attention as a non-invasive technique to study brain activity, especially in neuropsychological disorders. This technique has been proposed as an alternative to fMRI due to its low cost and usability in different conditions. fNIRS is particularly effective in assessing spatial memory and executive functions and has been widely used to investigate cortical responses during motor tasks in various populations, including healthy adults, the elderly, and those with neurological disorders. fNIRS studies have primarily focused on verbal fluency and Stroop tasks in healthy young adults and clinical samples, such as schizophrenic patients. This study aims to determine the applications and new insights of functional optical imaging in neuropsychological disorders. Search method: This study was conducted as a narrative review. 36 original articles from databases such as SID, PubMed, and Google Scholar were reviewed using the keywords "functional optical imaging", "neuropsychological disorders", "treatment", "neurorehabilitation" and "cognition". Finally, 8 selected articles were selected for more detailed analysis. Findings: The findings show that fNIRS has emerged as a valuable tool in investigating human cognition. This technique has a high potential in early diagnosis of neuropsychological disorders such as anxiety disorders, depression, autism, and ADHD. Also, fNIRS enables the evaluation of the effectiveness of therapeutic interventions such as neurofeedback and transcranial magnetic stimulation (TMS). This technique can serve as a complement to other neuroimaging methods such as fMRI and EEG. One of the key applications of fNIRS is in evaluating the effectiveness of therapeutic interventions such as

neurofeedback and transcranial magnetic stimulation (TMS). This technique can help form the patient's brain activity profiles and measure treatments' positive or negative effects more accurately. For example, in patients with depression, changes in prefrontal cortex activity are visible after TMS interventions, which can help improve treatment programs. Conclusion: fNIRS shows increasing importance in understanding neuropsychological disorders and enhancing neurorehabilitation strategies. fNIRS is also able to effectively monitor brain activity during rehabilitation tasks, showing positive outcomes for patients undergoing treatment after stroke or traumatic brain injury. Overall, fNIRS is recognized as a valuable tool in both research and clinical settings, providing new insights into brain function associated with neuropsychological disorders. Its applications in assessing cognitive processes and monitoring rehabilitation progress pave the way for more effective and personalized treatment strategies. Keywords: Functional optical imaging (fNIRS), neuropsychological disorders, cognition, treatment, neurorehabilitation

Keywords : Functional optical imaging (fNIRS), neuropsychological disorders, cognition, treatment, neurorehabilitation

Count: 170
Abstract ID: 669
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

The effect of transcranial direct current movement (tDCS) and exergy on ADHD patients

Submission Author: FATEMEH DALVAND

FATEMEH DALVAND[1], Mojtaba Khaksarian[2], Aboulfazl Jabarpour[3], ashkan ansary[4], mahbobeh sahlabadi[5], amir salehitaleghani[6], elham gholami[7], Masoumeh Sefidgari[8], Anahita Momeni[9]

1. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences
2. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences
3. Department of Physiology and Pharmacology, School of Medicine, Lorestan University of Medical Sciences.
4. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences
5. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
6. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
7. Department of Physiology and Pharmacology, School of Medicine Razi Herbal Medicines Research Center Mehr Psychiatric Hospital Lorestan University of Medical Sciences
8. Department of Clinical psychology, Electronic Islamic Azad University, Tehran, Iran
9. Student Committee on Medical Education Development ,Educational Development Center, Lorestan University of Medical Sciences,Khorramabad,Iran.

Background and Aim : This case report examines the combined effect of exergaming and transcranial direct current magnetic stimulation (tDCS) on attention deficit/hyperactivity disorder (ADHD). ADHD is one of the most common mental disorders in children that can have negative effects on academic performance and overall quality of life. Considering the challenges in the treatment of this disorder, new researches are looking for innovative and non-invasive methods to manage ADHD symptoms. The combination of movement games and tDCS has great potential to improve ADHD symptoms.

Methods : In this study, three children with accurately diagnosed ADHD underwent a series of cathodal tDCS sessions targeting the left lateral frontal region (DLPFC). Also, these children played movement games during the intervention. Evaluations were done before and after the intervention using standard scales.

Results : The results showed significant improvements in all three cases. Statistical analysis showed that there were values ??of $P<0.01$ for measures related to attention and $P<0.05$ for impulsivity evaluations. Participants showed significant reductions in their symptoms, including increased ability to focus and reduced distraction.

Conclusion : This study suggests that the combination of exergaming and tDCS may serve as a promising adjunctive treatment for ADHD. The results emphasize the importance of non-invasive interventions and show that this combination can be proposed as a new option next to traditional methods. More research is necessary to investigate the long-term effects and exact mechanisms of this method.

Keywords : tDCS, exergam, ADHD

Count: 171
Abstract ID: 170
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Oral

Evaluation the effectiveness of transcranial direct current stimulation on hand function in healthy individuals; A randomized controlled clinical trial study

Submission Author: Afsaneh Dadarkhah

Afsaneh Dadarkhah [1], Tayebi Sadat Salehi Rihanni[2], Sharareh Roshanzamir[3]

1. Clinical Biomechanics and Ergonomics Research Center, AJA University of Medical Sciences, Tehran, Iran
2. Clinical Biomechanics and Ergonomics Research Center, AJA University of Medical Sciences, Tehran, Iran
3. Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Shiraz University of Medical Sciences ,Shiraz, Iran

Background and Aim : Non-invasive brain stimulation techniques, such as magnetic stimulation and transcranial direct current stimulation (tDCS), offer new possibilities for modulating and improving brain function without causing pain or harm. tDCS is particularly appealing as a potential treatment method because of its low cost, ease of use, neurophysiological efficacy, and minimal adverse effects. This randomized clinical controlled trial aims to determine the effectiveness of tDCS on hand function in healthy individuals.

Methods : In this his randomized clinical controlled trial 54 healthy participants aged 20 to 45 years who referred to the physical medicine and rehabilitation clinic of Shiraz University of Medical Sciences were enrolled. In this study, grip power (assessed by dynamometer) and dexterity (assessed by Purdue Pegboard test) were defined as primary outcomes. These outcomes were evaluated at baseline and after the intervention. Data analysis was performed using SPSS version 22 software.

Results : In this study, 54 healthy participants aged 20 to 45 years who referred to the physical medicine and rehabilitation clinic of Shiraz University of Medical Sciences were examined. They were randomly allocated to either the intervention group (n=27) and the sham group (n=27). The study outcomes were defined as grip power (measured by dynamometer), and dexterity (measured by Purdue Pegboard test for right hand, left hand, both hands, and assembly). The outcomes were assessed before and after the intervention. No significant differences between the two groups in any of the outcomes were found at baseline or post-intervention ($p>0.05$ for all comparisons).

Conclusion : This study did not find any significant differences between the intervention and sham groups regarding the study outcomes (grip power and dexterity) before and after tDCS. However, within-group analyses revealed significant improvements in both groups after the

intervention. More studies are needed to establish the efficacy of tDCS on hand motor function, as the current evidence is insufficient.

Keywords : Transcranial Direct Current Stimulation, Grip Power, Hand Dexterity

Count: 172
Abstract ID: 278
subject: Novel and Cutting-Edge Technologies: Brain Stimulation Methods (ECT, rTMS, TDCS, DBS)
Presentation Type: Poster

Safety and Efficacy of Repetitive Transcranial Magnetic Stimulation (rTMS) in Cognitive Function Research: An Umbrella Review

Submission Author: Masoud GhaffarvandMokari

Masoud GhaffarvandMokari[1]

1. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran

Conclusion : Introduction: Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive method widely used for treating various neurological and cognitive disorders. The objective of this umbrella review is to provide a comprehensive overview of the safety of rTMS across different disorders and its efficacy in improving cognitive functions, along with recommendations for future research. Methods: This study utilized data from the scientific databases Google Scholar and PubMed, focusing on articles published between 2020 and October 1, 2024. Only review articles that included “rTMS” or “repetitive transcranial magnetic stimulation” in their titles were selected. A total of 260 articles were chosen to assess the potential adverse effects associated with the use of rTMS. Of these, 47 articles specifically examined the effects of rTMS on cognitive impairments and were analyzed in greater detail to evaluate efficacy. Results: In the review of 260 studies, encompassing 1034 independent articles, no lasting or severe adverse effects from rTMS interventions were reported. Additionally, among the 47 studies that focused on the impact of rTMS on cognitive functions, 41 studies employed rTMS as a standalone intervention, while 6 studies incorporated rTMS alongside other interventions. These studies covered various domains, including neurological and cognitive disorders, memory-related impairments, executive function, and linguistic abilities. Positive and significant outcomes were reported in 44 studies, whereas 3 studies did not observe significant improvements. Conclusion: These findings suggest that rTMS is a safe and effective method that can be more widely applied in clinical research and treatment settings. The high potential of rTMS in enhancing cognitive functions is evident, with over 90% of studies reporting significant improvements. Given the safety and efficacy demonstrated in these studies, increased research efforts may help to refine and expand clinical protocols, potentially allowing for less conservative approaches and broader use of rTMS in clinical practice.

Keywords : rTMS;Repetitive Transcranial Magnetic Stimulation;Cognitive function

Count: 173
Abstract ID: 155
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

Growth and Development of Brain-Computer Interfaces

Submission Author: Amin Ramezani

Amin Ramezani[1]

1. Sharif University of Technology, Tehran, Iran.

Conclusion : Given the rapid advancement of BCI technology and the substantial international investments, the future of this field appears highly promising. The need for a coordinated domestic program to leverage existing capacities, as well as the expansion of research and development in the critical infrastructure of this technology, is key to successful commercialization. Leading companies in this domain play a pivotal role in shaping the future of BCI and in creating a new global economic market.

Keywords : Brain-Computer Interface (BCI); International Investments; Neuralink; Technological Innovation;

Count: 174
Abstract ID: 308
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

Could AI by Pulse Regulated Abdominal Breathing Rehacore Application in Neural Biofeedback as a Computer Body Interface (CBI) Helps for Drug-Resistant Post-Traumatic Stress Disorder Patient

Submission Author: Mohammadjavad Hoseinpourfard

Mohammadjavad Hoseinpourfard[1], Jafar Aslani MD Pulmonary Interventional Professor[2]

1. Institute for Cognitive Science Studies, Tehran, Iran.
2. Baqiyatallah University of Medical Sciences, Tehran, Iran.

Background and Aim : Background and Aim: The brain; is the most complex organ in the body. This extraordinary and multifaceted organ is capable of experiencing and processing a wide and diverse range of emotions. Every emotion, from the happiest to the most painful, can have a profound and significant effect on a person's mental and physical health. Among these emotions, recalling or remembering traumatic experiences or distressing events activates specific areas of the brain that support and manage intense emotions, including fear, sadness, and anger. Active brain regions not only control the processing of feelings and emotions but other individual activities are modulated or regulated in many of these specific regions of the central nervous system (CNS). The CNS is an important part of our nervous system. In addition, these settings can have several profound effects on its activity. Among these effects are (a) integration of sensory input with motor output, (b) modulation of physiological arousal, which is how our body reacts to different situations and stimuli, and (c) stress reduction, which can help maintain overall mental and physical health. We often have vital signs; named. Over time, the effectiveness of pharmacological interventions, which are the first line of treatment for PTSD and other stress disorders, diminishes. This phenomenon can be due to several factors such as the development of drug tolerance, adverse side effects, or the individual's unique physiological responses to the drug. As a result, reducing the effectiveness of drug interventions makes it necessary to explore and use other non-drug treatment strategies.

Methods : The current study conducted to explore the prospective effectiveness of non-pharmacological therapeutic interventions. These interventions centered on learning tolerance and raising the threshold of resilience, managing various emotions and feelings. This is achieved by gradually increasing the threshold of flexibility in perceiving different stimuli, thereby enabling people to manage their emotional responses to different situations and experiences.

Results : Some complementary and drug-independent treatment methods in the field of clinical neuroscience include non-invasive brain interventions using electromagnetic waves, lasers, and conscious self-regulation methods. In the studies of this field, it observed that the number of

studies related to two methods of conscious self-regulation and non-invasive electrical stimulation of the brain are more useful than other methods used. Some studies have mentioned the effectiveness of these methods, especially when they are also used in combination at the same time.

Conclusion : The most important finding of these studies is determining the maximum effectiveness of the combined method of conscious self-regulation and non-invasive brain modulation using photobiomodulation therapy with other techniques such as Neurobiological Reprogramming Artificial Intelligent.and Neural Biofeedback therapy (NBFT).

Keywords : Post-Traumatic Stress Disorder (PTSD); Self-Regulation; Pulse Regulated Abdominal Breathing (PRAB); Rehacore Application; Neural Biofeedback; Computer Body Interface (CBI);

Count: 175
Abstract ID: 391
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

Artificial Intelligence for Smart Targeted Brain and Nerve Repairment

Submission Author: Nasibeh Rady Raz

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

1. Department of Artificial Intelligence in Medical Sciences, 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.
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 : Nerve cells have incomplete and slow regeneration. Artificial intelligence (AI), as a multidisciplinary field of study and technology, can be applied to improve nerve repair. There is a variety of research studies with different aspects focusing on AI applications in brain and nerve repair.

Methods : In this paper, we first review AI applications in brain and nerve repair. These applications include AI for detecting peripheral nerve injury by signal processing; motion control and rehabilitation by wearable devices and robotics; nerve injury therapy by implantable peripheral nerve interfaces and targeted electrical stimulation; brain-machine interfaces for disabled patients; AI-based control for prostheses and bionic; and AI-based robots to reduce surgical risk and complications, and facilitating postoperative recovery. Then, focusing on non-invasive AI-based nerve injury detection and targeted repair, we rank the features using machine learning algorithms to define possible AI-based neuro biomarkers.

Results : Performing multivariate analysis to detect effective neuro biomarkers, we define sets of AI-based neuro biomarkers for early non-invasive brain and nerve injury detection and therapy using a deep neural network.

Conclusion : AI-based neuro biomarkers for brain and nerve injury are used for non-invasive early detection and targeted therapy. In the future, we are going to use them as AI-based monitoring and an alarming method for prevention and personalized prognostic systems.

Keywords : Artificial intelligence; Nerve Repair; Personalized Medicine; Neuro Biomarkers

Count: 176
Abstract ID: 389
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Poster

Bridging Minds: A Review on Brain-to-Brain Interfaces between Human and Rat Models

Submission Author: Mozhan Parsa

Mozhan Parsa[1], Hamidreza Mahdiani[2]

1. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran
2. Faculty of Computer Science and Engineering, Shahid Beheshti University, Tehran, Iran

Conclusion : The research into the BBIs between human and rat brains opens a whole frontier of neuroscience, with huge implications in both basic science on brain function and interspecies communication. While non-invasive methods offer the opportunity to obtain especially important insights, semi-invasive and fully invasive methods will provide more opportunities for higher levels of information complexity. As technology advances, it needs to be matched by a comparable development of ethics to maintain humane practices in animal treatment. Future studies should work toward perfecting these techniques to further improve signal fidelity and extend the applications to more general neurorehabilitation and cognitive enhancement. In conclusion, without the exclusion of bridging this critical gap between human and rat brains, there might be not only improved knowledge about neural processes but also the development of novel therapeutic approaches for neurological disorders. This review accordingly underlines the need for an interdisciplinary approach in furthering BBI research and shows how BBI holds the potential to revolutionize the way we think about brain science.

Keywords : brain-to-brain interface (BBI); optogenetics; neurotechnology; neurorehabilitation

Count: 177
Abstract ID: 734
subject: Novel and Cutting-Edge Technologies: Brain Machine Interface and Neuroengineering
Presentation Type: Oral

Stable Neural Signal Decoding for Brain-machine Interfaces: Leveraging Manifold Alignment to Compensate for Instabilities

Submission Author: Mohammadali Ganjali

Mohammadali Ganjali[1], Alireza Mehridehnavi[2], Abed Khorasani[3]

1. Department of Biomedical Engineering, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Biomedical Engineering, Isfahan University of Medical Sciences, Isfahan, Iran
3. Department of Neurology, Northwestern University, Chicago, IL, 60611, USA

Background and Aim : Brain-machine interfaces (BMIs) offer promising solutions for individuals with paralysis or spinal cord injury (SCI) to restore movement control. However, the instability of neural recordings poses a significant challenge to decoding accuracy and usability.

Methods : To address this challenge, this study explores the use of dimensional reduction methods, manifold alignment techniques, and machine learning based decoder to stabilize neural signal decoding. this study aims to enhance decoding accuracy and usability of BMIs for individuals with neurological movement disorders, by transferring neural activity to a low-dimensional neural manifold and aligning it using canonical correlation analysis (CCA). Used dataset comprised neural activity and behavior from a monkey performing a center-out reaching task. Neural activity was recorded using 96-channel arrays implanted in the monkey's primary motor cortex (M1), while movement parameters were recorded during task performance. Dimensionality reduction methods, including Principal Component Analysis (PCA) and demixed Principal Component Analysis (dPCA), were employed to extract low-dimensional neural manifolds. The canonical correlation analysis (CCA) alignment method was then used to align train and test neural manifolds, compensating for instabilities. Finally, a machine learning-based linear multivariate regression decoder was trained using the aligned manifolds to predict movement parameters.

Results : Results demonstrate significant improvements in decoding performance using the CCA alignment method. Aligned manifold decoding methods (PCA-CCA, dPCA-CCA) outperformed traditional manifold decoding, with R^2 values of 0.71 and 0.71, respectively. Moreover, these methods exhibited robust decoding performance across different amounts of instabilities, highlighting their effectiveness in compensating for neural instability in BMI decoding.

Conclusion : The proposed stable neural signal decoder, leveraging manifold alignment techniques, shows promising results in compensating for instabilities in BMI decoding. By transferring neural activity to a low-dimensional space and aligning neural manifolds, stable

and accurate decoding of movement parameters is achieved. This approach holds significant potential for improving the clinical translation of BMIs and restoring movement control for individuals with neurological movement disorders.

Keywords : Brain-machine Interfaces; Movement Decoding; Neural Manifold; Canonical Correlation Analysis; Dimensionality Reduction

Count: 178
Abstract ID: 597
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Investigating the effect of short and long-term presence of lithium chloride on the electrophysiological properties of the cultured neural network

Submission Author: Ali Shokri Dehnow

Ali Shokri Dehnow[1]

1. 1. Department of Brain and Cognitive Science, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR 2. Department of Stem Cell and Developmental Biology, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR

Background and Aim : Lithium is widely used in the treatment of psychological disorders such as bipolar disorder and in nervous system truma studies, such as spinal cord injuries. The mechanism of action of this drug and its effects on nerve cells are not fully understood; in vitro studies have identified that one of the most well-known effects of this drug is the inhibition of electrophysiological activities. One of the most important targets of this drug is GSK-3 (glycogen synthase kinase 3), which it inhibits. One aspect that has been less studied is the effect of lithium on electrophysiological parameters at the neural network level

Methods : In this study, we used the cortex of 16 to 18-day-old rat embryos, which were subjected to mechanical and enzymatic digestion, and the resulting cells were cultured on a Multi Electrode Array plate. After creating the neural network, a baseline recording was taken from all channels of the plate, and then lithium was applied at a concentration of 1.5 mM for seven days. Subsequently, recordings were taken again from the plates, and the resulting data were analyzed and compared

Results : In the present study, while the two-dimensional neural network cultured from rat origin was successfully created, it was found that the application of lithium over seven days significantly increased the number of spikes (P value: 0.0088), the number of bursts (P value: 0.00076), and the mean amplitude of spikes (P value: 0.051).

Conclusion : The data show that the presence of lithium long-term shifts the balance of activity in the cultured neural network towards increased exitation and activity

Keywords : Neural network, MEA, lithium, electrophysiology

Count: 179
Abstract ID: 477
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Oral

Isolation and characterization of human amniotic fluid and SH-SY5Y/ BE (2) M17 cell (neuronal stem cell models) derived exosomes

Submission Author: Nayer Seyfizadeh

Nayer Seyfizadeh[1]

1. Neurosciences Research Center, Tabriz University of medical sciences, Tabriz, Iran

Background and Aim : The application of stem cells as a therapy for degenerative disease holds great promise. Substantial evidence suggests that stem cell derived exosomes are a novel cell-free therapy for the corresponding cells. Exosomes are less complex as compared to their parental cells, due to the fewer number of membrane proteins. In addition, the smaller size and lower risk of immunogenicity makes exosomes potentially safe therapeutic Nano-carriers. A large number of ongoing research studies are focused on characterizing exosomes that were derived from different sources, for their potential use in various therapeutic applications. In the present study, we focused on characterizing exosomes derived from SH-SY5Y and BE (2) M17 cells (human neuroblastoma cell lines that are commonly used for modelling neurodegenerative diseases, and for studying basic mechanisms in neuroscience), such as paracrine therapy/Nano carrier.

Methods : we characterized, for further characteristic analyses of neuronal differentiation and neurobiology. Finally, we compared various exosome isolation techniques and procedures and evaluated exosome yield whit Cell culture and sample collection, flowcytometry, western Blot, DLS (dynamic light scattering), Ultracentrifugation and ...

Results : Exosomal yield varies with isolation method but not with the cell passage's number, Flow cytometry analysis showed the expression of both exosomal markers (CD9 and CD63) on the surface of exosomes derived from all three samples (i.e., SH?SY5Y, BE(2)?M17, and hAFs, We found that average exosome diameter was 54.33±20.35, 49.78± 3.43, 21.44±6.11, respectively, for isolated exosomes from hAF, SH?SY5Y, and BE(2)?M17

Conclusion : we concluded characterizing SH-SY5Y and BE(2)-M17 derived exosomes as well-known neuronal models will help to advance our understanding of neurobiology and neuronal differentiation, and develop new therapeutic approaches for neurodegenerative disease. In addition, major challenges need to be addressed to bring exosome technology into clinic, such as developing efficient standardized isolation and purification methods.

Keywords : exosome, characterization, neuronal stem cell model, SH-SY5Y, BE (2) M17, human amniotic fluid

Count: 180
Abstract ID: 675
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Mecamylamine: Transitioning from Antihypertensive Agent to Potential Neurological Therapy

Submission Author: Mahdiyeh Safary

Mahdiyeh Safary[1], MohammadReza Zarrindast[2], Sakineh Alijanpour[3]

1. Department of Pharmacology and Toxicology, Faculty of Pharmacy and Pharmaceutical Sciences, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
2. Professor of Pharmacology, Department of Pharmacology School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Associate Professor of Biology, Department of Biology, College of Science, Gonbad kavous University, Gonbad, Iran

Conclusion : Introduction: Mecamylamine, a nonselective and noncompetitive antagonist of nicotinic acetylcholine receptors (nAChRs), was the first antihypertensive medication administered orally, introduced in the 1950s. However, its prescription for hypertension has become rare in modern medical practice due to considerable ganglionic side effects associated with therapeutic doses. Notably, mecamylamine is characterized by complete absorption, rapid onset of action, and prolonged duration of effect, demonstrating beneficial impacts on the central nervous system (CNS) at doses significantly lower—three times less—than those needed for hypertension treatment. In light of the growing body of evidence highlighting the involvement of nAChRs in the onset and management of various neuropsychiatric disorders over the past decade, mecamylamine has emerged as a promising therapeutic option for conditions such as mood disorders and substance dependence. Method: Systematic research was performed using PubMed, MEDLINE, Cochrane libraries, and Google Scholar databases to find new potential therapeutical aspects of mecamylamine. English-language review articles, clinical trials, and case reports published between 2000 and 2024 were surveyed. Result: Mecamylamine, a nicotinic acetylcholine receptor (nAChR) antagonist, has been investigated for its potential roles in various neuropsychiatric disorders. In the context of depression, there is a significant correlation between smoking and major depressive disorder, with clinical studies suggesting that mecamylamine may possess antidepressant properties. In terms of nicotine dependence, mecamylamine's effectiveness for smoking cessation remains ambiguous. While some research indicates that it may help reduce nicotine self-administration and alleviate withdrawal symptoms, other studies report no substantial benefits when used alongside nicotine replacement therapies. For schizophrenia, dysregulated nAChRs are linked to cognitive deficits. Although nicotinic agonists may enhance cognitive function, mecamylamine appears to block nicotine-induced cognitive improvements without significantly impacting smoking behavior or neuropsychological performance in non-smokers. Regarding cocaine dependence, mecamylamine has been proposed to mitigate cocaine cravings, but findings across studies are inconsistent. In the realm of alcohol dependence, mecamylamine has demonstrated the ability to lower breath alcohol levels and diminish the rewarding effects of alcohol in healthy individuals. In the treatment of Tourette’s Syndrome,

mecamylamine was thought to potentially alleviate symptoms by influencing nicotine-induced receptor inactivation. However, studies have yielded mixed results, showing some improvements in mood and behavior but no notable effects on tic symptoms. For autism, which is characterized by social impairments and repetitive behaviors, nAChR antagonists may help restore cholinergic balance. Antidepressants with nAChR-blocking properties are also utilized for managing symptoms. Lastly, in epilepsy, mutations in neuronal nAChRs have been linked to nocturnal frontal lobe epilepsy, and nicotinic antagonists are being explored for their potential in seizure management. Overall, while mecamylamine shows promise across various conditions, its efficacy and role in treatment remain subjects of ongoing research. Conclusion: The role of nAChRs in the etiology and management of several neuropsychiatric disorders suggests that mecamylamine may be beneficial in addressing conditions such as depression, nicotine addiction, cocaine addiction, alcohol addiction, Tourette's syndrome, autism, and epilepsy. Continued research is crucial for the progression of therapeutic nicotinic agents, and recent studies on innovative nicotinic compounds show encouraging results.

Keywords : Mecamylamine; Antagonist of nicotinic acetylcholine receptors; Neuropsychiatric disorders; Mood disorders; Substance dependence

Count: 181
Abstract ID: 498
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Biosynthesis of nanoparticles and their efficacy for the treatment of CNS diseases

Submission Author: Sara Salatin

Sara Salatin[1]

1. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : The treatment of central nervous system (CNS) diseases is highly limited due to the presence of the blood-brain barrier (BBB). In this regard, metal nanoparticles (NPs) have been displayed as a promising nanoplatform for brain imaging and drug delivery. However, there is a concern when using metal NPs for the treatment of neurological diseases, as they may induce neuroinflammation, oxidative stress, apoptosis, and autophagy. Metal NPs biosynthesized using various biomaterials such as plant tissues, bacteria, yeast, fungi, and alga provides a new option for the treatment of CNS diseases. Various metal NPs such as Ag, Au, Fe, Cd, Pd, and Rh can be green synthesized using natural materials. Natural biomaterials play double roles as they trigger the reduction mechanism and act as capping agents. It was reported that green synthesized metal NPs have a favorable biocompatibility profile to the CNS tissues compared to chemically synthesized metal NPs. However, it is necessary to use appropriate experimental and animal models that recapitulate the complexity of CNS diseases and successfully predict the therapeutic efficacy of green metal NPs.

Keywords : Nanoparticles, central nervous system (CNS), blood-brain barrier (BBB), neurological diseases

Count: 182
Abstract ID: 489
subject: Novel and Cutting-Edge Technologies: Drug Discovery and Neuropharmacology
Presentation Type: Poster

Intravenous administration of nanoparticles for the treatment of neurological diseases

Submission Author: Sara Salatin

Sara Salatin[1]

1. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : The management of neurological diseases is very challenging due to the presence of the blood-brain barrier (BBB). The advancement of nanoparticle (NPs) provides a new direction for the management of neurological diseases. A wide variety of NP-based systems have been proved to be efficacious in passing the BBB after intranasal administration in vivo. However, physicochemical features of NPs (e.g. composition, shape, size, surface charge, and surface chemistry) exhibit significant effect on their biodistribution and ability to penetrate the BBB. The intravenous administration of natural NPs have received considerable interest in brain drug delivery because of their higher biocompatibility and lower toxicity. The surface modification of NPs with specific ligands has been highly suggested in recent years. However, it is necessary to address the differences in NPs permeability in healthy and disease animal models. Additionally, the development of potential in vivo imaging systems can help address whether and how NPs cross the BBB.

Keywords : Bood brain-barrier; nanoparticles; neurological diseases, imaging

Count: 183
Abstract ID: 290
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Poster

Exosome-mediated therapeutic delivery: A new horizon for human neurodegenerative disorders' treatment (with a focus on siRNA delivery improvement)

Submission Author: Nayer Seyfizadeh

Nayer Seyfizadeh[1]

1. Neurosciences Research Center, Tabriz University of medical sciences, Tabriz, Iran

Conclusion : In this paper we discussed Exosome-siRNA therapies represent a promising next generation approach for neurodegenerative diseases treatment. However, applying them in clinic demands synergistic resolving strategies to overcome several technological and mechanistic obstacles; including consistent large-scale GMP-grade production, isolation and storage of exosomes, pharmaceuticals, evaluation method for therapeutic efficacy and safety.

Keywords : Exosome, neurodegenerative diseases, CNS diseases, SiRNA, Gene therapy

Count: 184
Abstract ID: 279
subject: Novel and Cutting-Edge Technologies: Molecular, Biochemical, and Genetic Techniques & Gene . Therapy
Presentation Type: Poster

Emerging Functional Roles of Long Noncoding RNA and LncRNA-Encoded Peptides in Glioma

Submission Author: SeyedehZahra Bakhti

SeyedehZahra Bakhti[1]

1. Department of Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran

Conclusion : The role of long non-coding RNAs (lncRNAs) and peptides encoded by lncRNAs in glioma is an emerging area of research that highlights the complexity of gene regulation and the potential for novel therapeutic targets. Traditionally, lncRNAs were thought to function solely as regulatory molecules without coding potential. However, recent studies have revealed that some lncRNAs contain open reading frames (ORFs), which can indeed encode small peptides that play significant roles in tumor biology, including glioma. LncRNAs and peptides derived from them play multifaceted roles in glioma biology, influencing tumor progression and therapeutic response. Some of them play the role of oncogenic and some tumor suppressor. Their ability to regulate key cellular processes and interact with various signaling pathways positions them as promising candidates for further investigation in glioma research. As our understanding of lncRNA and lncRNA-derived peptide functions deepens, it is likely that they will become integral components of diagnostic and therapeutic strategies in the management of gliomas. This study will explore the mechanisms through which these lncRNAs and lncRNA-derived peptides contribute to glioma pathogenesis, their functional implications, and potential therapeutic applications.

Keywords : LncRNAs; Peptides; Glioma

Count: 185
Abstract ID: 318
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

Tip Optical Fiber LSPR Sensor Based on DNA Aptamer for Dopamine Detection

Submission Author: Soroush Rostami

Soroush Rostami[1], Mohammad-Mahdi Babakhani-Fard[2], Fatemeh Arefnia[3], Roksana Esmaeilpour[4], Mohammad Ismail Zibaii[5]

1. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 19839 69411, Iran.
2. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 19839 69411, Iran.
3. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 19839 69411, Iran.
4. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 19839 69411, Iran.
5. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 19839 69411, Iran.

Background and Aim : Dopamine (DA) is one of the critical neurotransmitters that affects several function of the brain. One of neuroscience's challenges is the real-time measurement of DA levels in in-vivo research. To addressing this issue various advanced optical biosensors have been develpoed. Fiber optic biosensors (FOBs) can be a good candidate for in-vivo detection. One of the common label-free FOB is based on Local Surface Plasmon Resonance (LSPR) phenomenon using Au nanoparticles (AuNPs). In the LSPR-sensors, interacting of the evanescent field of AuNPs with mexternal medium can be used for refractive index (RI) sensing. By monitoring change in the RI, these sensors offer an excellent platform for label-free detection. In the past few decades, aptamer-based biosensors have gained significant interest due to their remarkable sensitivity and selectivity. In this study, a apta-FOB based on LSPR proposed for detection of DA. According to modal coupling theory, maximum optical attenuation occurs when the propagation constant of the optical-fiber core mode is equal to the propagation constant of the LSPR. When immobilized DNA aptamer to the AuNPs bound with sensing target, the structure of aptamer would change. This affects on effective RI and the output signal of the sensor.

Methods : AuNPs were synthesized based on Turkevich method. Characterization of NPs by UV-visible spectrophotometer, DLS-analysis and FE-SEM microscopy determind average diameter size of 30 nm. AuNPs immobilized on tip multimode optical-fiber with core diameter of 62.5 μm based on Mercaptosilane modification.

Results : For measuring RI sensetivty of the sensor, the sensor response was measured in different concentrations of ethanol solutions in the range 1.3332-1.3604 RIU at room temperature. Obtained RI sensetivity of the sensor was 365 nm/RIU (as shown in Fig.3.) For sepecefic detection of DA, DNA aptamer immobilized on the Au NPs based on covalent method. After that, prob immersed in different concentration of DA in the ranges of 1pM – 100 nM. DA sensitivity of the sensor was obtained 1.69 nm/Log(M). Also, the selectivity of the

apta-sensor was measured using Epinephrine (EP) solution in the same range. Obtained results show that the sensor response to EP was negligible .

Conclusion : This study utilizing a aptamer-fiber optic biosensor based on LSPR for detection of DA. This method showed a good sensitivity and selectivity to DA with a limit of detection 47 pM. Also, due to a small size this prob has promising in-vivo applications.

Keywords : Dopamine Sensor; Optical Fiber LSPR Sensor; Dopamine Aptamer; Tip Optical Fiber; Label Free Sensor; Au nanoparticles

Count: 186
Abstract ID: 557
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

Parkinson's Disease Screening by Generating Artificial Data Point in Latent Space

Submission Author: Yasaman Haghbin

Yasaman Haghbin[1], Hadi Moradi [2], Reshad Hossieni[3]

1. University of Tehran
2. University of Tehran
3. University of Tehran

Background and Aim : The performance of machine learning models is dependent on the size of the training data. This is clearly seen in medical studies where data acquisition is costly and time-consuming, and thus produces limited datasets which affects the ideal machine learning algorithms results. Neurodegenerative diseases, such as Parkinson's disease, are particularly affected by this limitation, as the collection of large-scale data on patients is constrained by time, cost, and the availability of participants. These often lead to the generation of models that have a high tendency of overfitting and hence poor generalizations. In response to this challenge, we developed a new method to improve the learning of machines by creating synthetic data.

Methods : Our method involves feature extraction, where it extracts facial Action Units (AUs) to represent key aspects of facial expressions. AUs encode specific facial muscle movements, which are particularly useful in detecting symptoms of Parkinson's disease, such as hypomimia (reduced facial expressions). After feature extraction, we applied K-means clustering to group data points based on the similarities in these extracted features. Next, our method triggers a cluster evaluation through a class separation metric. This evaluation makes sure that clusters with data from the different classes are made to be finer to improve the homogeneity. The separation measure calculates the distance between classes and the coherency inside clusters. If a cluster that has been identified contains more than one class, we trigger a re-clustering process to improve the separation between different classes. This refinement process becomes important because the data generated in subsequent steps of synthesis is derived from well separated and purely sampled clusters. In the next phase, the algorithm adopts the normal distribution to generate synthetic data point for each homogeneous cluster based on the parameters derived.

Results : Our method was applied to Parkinson's disease screening. There are facial expressions obtained from the patient and normal control, with emotions; angry, happy, disgusted, fearful, and surprised forming the dataset. Each facial expression was associated with specific AUs, which were used as the. The results obtained from the experiment revealed that our approach increased classification performance for various machine learning

algorithms. Through cross-validation using majority votes over different emotions, our method scored 90.90% cross- validation accuracy and 83.33% test accuracy.

Conclusion : Our method not only improves machine learning models' efficiency but also generates high-quality synthetic data to benefit the expansion of diagnostic tools and research for neurodegenerative diseases.

Keywords : Parkinson's disease screening; Synthetic Data Generation; Small datasets

Count: 187
Abstract ID: 582
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

Screening Parkinson Disease Using Fine-motor Skills

Submission Author: Maryam Dadkhah

Maryam Dadkhah[1], Mohammad Rohani[2], Amirhasan Habibi[3], Maziar Emamikhah[4], Hadi Moradi[5], Reshad Hosseini[6]

1. University of Tehran
2. Iran University of Medical Sciences
3. Iran University of Medical Sciences
4. Iran University of Medical Sciences
5. University of Tehran
6. University of Tehran

Background and Aim : Parkinson's disease is a neurodegenerative disorder for which no curative treatment exists, making early detection essential for symptom management and enhancing patient quality of life. This study focuses on fine-motor skill impairments, specifically drawing tasks, as these are activities familiar to elderly individuals, who are predominantly affected by Parkinson's disease. By leveraging the Parkinson App, we extract features from drawn patterns, enabling a non-invasive and easily implementable screening tool. This method facilitates continuous monitoring without requiring frequent in-person consultations with specialists. The symptoms analyzed include micrographia, characterized by increasingly cramped handwriting, and tremors, both of which can be detected through spiral drawing tasks, a key focus of this investigation.

Methods : Two data types were utilized from the Parkinson App's drawing module: static images of drawn patterns and time-series data capturing the progression of the drawing over time. We employed Convolutional Neural Networks (CNNs) to classify the images, with a particular emphasis on spiral patterns to detect symptoms such as micrographia. Additionally, time-series data, representing the temporal evolution of path curvature, acceleration, and other higher-order dynamics, were modeled using CNNs, Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) networks, and metric learning techniques to capture and classify the fine-motor impairments associated with Parkinson's disease.

Results : The highest classification accuracy was achieved using CNNs on the images of spiral patterns. These findings are especially relevant given that motor symptoms such as tremor and micrographia are present in approximately 60% of Parkinson's patients, highlighting the potential of this approach for effective screening within this population.

Conclusion : The methodologies presented in this study offer a cost-effective and scalable solution for Parkinson's disease screening, utilizing mobile applications to detect early motor symptoms through drawing tasks. While the results reflect the variability of symptom

manifestation in Parkinson's patients, the proposed approach holds promise for facilitating early intervention and improving patient outcomes.

Keywords : Parkinson's disease screening; fine-motor skills; handwriting

Count: 188
Abstract ID: 586
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Oral

Comprehensive App for Parkinson's Disease Screening and Monitoring: A Pilot Study

Submission Author: Atefeh Irani

Atefeh Irani[1], Yasaman Haghbin[2], Maryam Dadkhah[3], Saeed Maroof[4], Farnaz Sedaghati[5], Maziar Emamikhah[6], Mohammad Rohani[7], Reshad Hosseini[8], Hadi Moradi[9]

1. University of Tehran, University of British Columbia
2. University of Tehran
3. University of Tehran
4. University of Tehran
5. University of Tehran
6. Iran University of Medical Science
7. Iran University of Medical Science
8. University of Tehran
9. University of Tehran

Background and Aim : Parkinson's disease (PD) is a progressive neurodegenerative disorder that affects muscle coordinating, causing symptoms such as tremors, muscle stiffness, slowness of movement and cognitive decline. Early screening and continuous monitoring are critical to slow disease progression. However, many traditional screening methods face challenges related to the patient accessibillity, high costs, and need for specialized skills. In order to overcome these limitations, we have created an app that gathers data on symptoms of Parkinson's disease using innovative methods.

Methods : Our application has five distinct modules designed to assess various PD symptoms. The first module is a drawing task that evaluates fine motor skills, analyzing user drawings to detect signs of tremors, micrographia, and rigidity. The second and third modules assess emotional symptoms: one evaluates facial emotion expression based on user responses to visual stimuli, while the other analyzes vocal emotions. The fourth module is a questionnaire designed to uncover other common PD symptoms. The fifth module is a game that captures vocal characteristics such as intensity, pitch fluctuations, and tone. Together, these modules provide a comprehensive view of how PD manifests across multiple symptom domains.

Results : In a pilot study, we enrolled 70 participants, including 36 patients diagnosed with PD and 34 healthy controls. To ensure diagnostic accuracy, we collaborated with Rasol Akram Hospital, where specialists reconfirmed the PD diagnoses for all patients. The control group was carefully selected to exclude individuals with other neurological conditions that could mimic PD symptoms, with a focus on elderly participants to match the demographic profile of the PD group.

Conclusion : Our application represents a promising solution for improving PD screening and monitoring, offering clinicians an accessible and reliable method to track symptom dynamics and manage patient care more effectively.

Keywords : Parkinson's Disease, Neurodegenerative Disorders, Remote Monitoring, Symptom Tracking, Motor and Cognitive Assessment

Count: 189
Abstract ID: 459
subject: Novel and Cutting-Edge Technologies: Other
Presentation Type: Poster

Generating Patient-Specific Neurons: A Novel Clinically Relevant Approach for Modeling Alzheimer's Disease through Fibroblast Transdifferentiation

Submission Author: Sabhba Shahbazi

Sabhba Shahbazi[1], Zahra Khoshkam[2], Koorosh Shahpasand[3], Mehran Habibi Rezaie[4]

1. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.
2. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.
3. Department of Brain and Cognitive Sciences, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR, Tehran, Iran.
4. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

Background and Aim : The direct conversion of human fibroblasts into induced neurons (iNs) provides a significant resource for investigating neurodegenerative disorders such as Alzheimer's disease. This method demonstrates considerable clinical potential because it allows the generation of patient-specific neurons that preserve the aging characteristics of the donor. Unlike induced pluripotent stem cells (iPSCs), which lose these aging traits, transdifferentiated neurons provide a more accurate model for studying age-related diseases. Moreover, this approach is faster and less complex, making it more feasible for clinical applications. However, generating neurons from high-passage fibroblasts, especially from elderly patients, has been a major challenge. In this study, we developed an optimized protocol to overcome these barriers and improve the efficiency of neuronal conversion.

Methods : Lentiviral particles were generated by co-transfecting Lenti-X 293 cells with helper plasmids pMD2.G, psPAX2, and the shR1R2PBPA construct, which contained the transcription factors Ascl1 and Brn2 along with shRNA targeting REST. Human dermal fibroblasts from six Alzheimer's patients (two EOAD, four LOAD) and one healthy individual were plated at a density of 300,000 cells per well. The cells were transduced with lentiviral particles and cultured in a fibroblast medium. On the third day, the medium was replaced with a neural induction medium consisting of a 1:1:1 mixture of neural-conditioned medium (NCM), mouse glial-conditioned medium (mGCM), and Neurobasal medium, supplemented with CHIR99021, valproic acid, and neurotrophic factors. On day 10, cells were replated on poly-L-ornithine, laminin, and fibronectin-coated wells using Accutase, and survival was improved using ROCKi and ascorbic acid. By day 25, the cells were analyzed for expression of neuronal markers.

Results : By day 25, Western blot, real-time PCR, and immunocytochemistry confirmed the expression of neuronal markers, including MAP2 and TAU, in approximately 50% of the

transdifferentiated cells. This demonstrated successful neuronal reprogramming. The protocol was effective across fibroblast samples from both early-onset and late-onset Alzheimer's patients. Using conditioned media and survival factors like ROCKi and ascorbic acid significantly improved neuronal yield and viability, making this method clinically relevant for generating neurons from difficult-to-reprogram fibroblasts.

Conclusion : This study describes an efficient and clinically relevant method for generating neurons from human fibroblasts, particularly from high-passage and elderly patient samples. This optimized protocol offers a scalable and reproducible method for generating patient-specific neurons, which is crucial for modeling neurodegenerative diseases like Alzheimer's. Importantly, this approach not only enhances our understanding of the molecular mechanisms underlying these diseases but also provides a robust platform for testing the effects of potential therapeutics.

Keywords : Cell Reprogramming; Conditioned media; Aging; Neuronal Differentiation; Lentiviral Vectors

Count: 190
Abstract ID: 642
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

AHR activation by PM2.5 particles leads to down-regulation of HIF1α/Neuroglobin and increased ER stress in SH-SY5Y cells

Submission Author: Zahra Khoshkam

Zahra Khoshkam[1]

1. Department of Plant, Cell, and Molecular Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran.

Background and Aim : Alzheimer's disease is a multifactorial disease, and air pollution is among the main risk factors. PM2.5 particles are the most dangerous airborne pollutants in many urban areas, linked to various health issues, including neurodegenerative diseases. These particles are a complex mixture of hazardous compounds including Polycyclic Aromatic Hydrocarbons (PAHs) which can activate the intracellular transcription factor named as Aryl Hydrocarbon Receptor (AHR). Hypoxia is also a key risk factor in developing neurodegenerative diseases and AD, which is regulated by the HIF1α transcription factor and hypoxia-responsive proteins including neuroglobin. AHR and HIF1α for doing their function as a transcription factor both need a common nuclear translocator, termed as ARNT. For this reason, we hypothesized that AHR activation by PM2.5 particles may lead to the downregulation of HIF1α and neuroglobin in neural cells, which in turn may result in increased ER stress and neurotoxicity.

Methods : For this study, we collected and extracted cold-season PM2.5 samples from a central polluted part of Tehran, and we characterized the combined extracted sample for PAHs and other important compounds. Neuroblastoma SH-Sy5y cells are used as a cellular model for investigating PM2.5-induced AHR activation and its effects on AD-associated markers including hypoxia pathway, BACE1 gene expression, cell viability, and ER stress.

Results : The results of our cell culture studies showed that PM2.5 particles lead to activation of aryl hydrocarbon receptor (AHR) and an increased expression of CYP1a1 and NRF2 genes, resulting in the decreased activity of HIF1α and downregulation of neuroglobin expression. This possibly leads to induction of hypoxia and the decreased capacity of cells against ROS which resulted in an increased expression of beta-secretase enzyme transcript. Here, we evaluated the role of resorcinol in suppressing AHR activity and its effects on the hypoxia-responsive pathway. PM2.5-induced AHR activation suppressed by resorcinol resulted in the upregulation of HIF1α and neuroglobin gene expression. Following AHR suppression we also observed decreased expression of beta-secretase and reduced ER stress and cellular death in the presence of PM2.5 particles.

Conclusion : Our results confirm the proposed hypothesis and the significant role of AHR activation in the perturbation of the hypoxia-responsive pathway and increased AD-associated

cellular markers. Our findings may also demonstrate a possible association between air pollution and PM2.5 exposure with increased hypoxia in the brain and the increased risk of Alzheimer's disease in polluted areas with high levels of PM2.5.

Keywords : Alzheimer's disease; PM2.5 particles & PAHs; AHR activation; Hypoxia and HIF1α; Neuroglobin; ER stress

Count: 191
Abstract ID: 164
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Vitamin B12 Reduce Density of Cytochrome C-immunoreactive Neurons in the Hippocampal CA1 Area of Male Rat Model of Alzheimer's disease

Submission Author: Fatemeh Saraei

Fatemeh Saraei[1], Emsehgol Nikmahzar [2], Mehrdad Jahanshahi [3], Elsana Jahanshahi [4], Fateme Yazdani [5], Leila Elyasi [6], Gozal Bahlakeh [7]

1. Student Research Committee, Golestan University of Medical Sciences, Gorgan, Iran
2. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
3. Neuroscience Research Center, Department of Anatomy, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
4. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
5. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
6. Neuroscience Research Center, Department of Anatomy, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
7. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran

Background and Aim : There is growing body of evidence that vitamin B12 possesses neuroprotective effects and has crucial role for the development and functioning of the nervous system. Alzheimer's disease (AD) is a neurodegenerative disorder that its pathological symptoms are amyloid β plaque deposition, neurofibrillary tangles, cholinergic dysfunction, oxidative stress, neuroinflammation, apoptosis, synaptic impairment and loss of neurons. Apoptosis has important role in the pathogenesis of AD and also, cytochrome C, a mitochondrial protein, is mediator of this process. The purpose of this research was to explore the vitamin B12 impact on the density cytochrome C- immunoreactive (ir) neurons in the hippocampal CA1 area of male rat model of AD.

Methods : A total of 56 Adult Wistar rats were randomly divided into seven groups, each containing 8 rats: Control, Saline, Sco (3 mg/kg, IP) + saline, and vitamin B12 treated groups (sco + vit B12: 0.5, 2, 4, 8 mg/kg, IP, for a duration of 14 days). For histological examination, brain sections was stained with immunohistochemical staining for cytochrome C-ir neurons and number of this neurons were counted in the hippocampal CA1 area within a 30000 μm2 area.

Results : The injection of scopolamine increased significantly the number of cytochrome C-ir neurons in the hippocampal CA1 area ($P<0.01$). Following 14 continuous days of administration of vitamin B12 with various doses was found to significant the number of cytochrome C-ir neurons in the hippocampal CA1 area in comparison with the Sco + saline group ($P<0.05$, $P<0.01$, $P<0.001$). Most effective dose of vitamin B12 was determined to be 2 mg/kg.

Conclusion : It seems that vitamin B12 may have potential benefits in AD with reducing the density of cytochrome C-ir neurons in the hippocampal CA1 area.

Keywords : Vitamin B12; Cytochrome C-ir neuron; Hippocampus; CA1 area; Immunohistochemistry staining

Count: 192
Abstract ID: 165
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Administration of Taurine Can Compensate for Neuronal Loss in the Prefrontal Cortex of Alzheimer Disease Model Rats

Submission Author: Abbas Hemmat

Abbas Hemmat[1], Emsehgol Nikmahzar [2], Leila Elyasi [3], Sara Gorgani [4], Mehrdad Jahanshahi[5], Elsana Jahanshahi [6], Gozal Bahlakeh [7]

1. Student Research Committee, Golestan University of Medical Sciences, Gorgan, Iran
2. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
3. Neuroscience Research Center, Department of Anatomy, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
4. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
5. Neuroscience Research Center, Department of Anatomy, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
6. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
7. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran

Background and Aim : Taurine is a 2-aminoethanesulfonic acid and it have roles in thermal regulation, anti-inflammation, anti-oxidation, osmoregulation and development of CNS. It also prevents toxicity in neurons in neurodegenerative disease such as Alzheimer disease (AD). Taurine is able to ameliorate cognitive function and reduce amyloid β accumulation. To date, the role of taurine in preventing neuronal loss in AD has not been investigated. Therefore, this study examined the protective and treatment effects of taurine on density of neurons in the prefrontal cortex in scopolamine induced AD model rats.

Methods : Adult male Wistar rats were injected with taurine (25, 50, and 100 mg/kg, IP, for 14 consecutive days) before and after injection of scopolamine (3 mg/kg, IP). After histological processing, brain slides were stained with cresyl violet for prefrontal cortex neurons. The number of neurons was counted in the rat prefrontal cortex within 30000 μm2 area.

Results : Injection of scopolamine significantly decreased density of neurons in the rat prefrontal cortex compared with control group ($P<0.0001$). Our results showed that pretreatment with different doses of taurine for 14 consecutive days significantly increased density of neurons in the rat prefrontal cortex in compare to saline + sco group ($P<0.0001$). Treatment with three doses of taurine significantly increased neuronal density in the rat prefrontal cortex in compare to sco + saline group ($P<0.0001$).

Conclusion : Taurine had protective and treatment effects versus loss of neuronal density in the rat prefrontal cortex. Thus, taurine may be protective and treatment agent against neurodegeneration in AD.

Keywords : Alzheimer's disease; Taurine; Neurons; Cresyl violet staining; Prefrontal cortex

Count: 193
Abstract ID: 204
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Green Synthesis of Silver Nanoparticles Using Hydroalcoholic Extracts of Green Tea and Coffee, and Evaluation of Their Effects on Memory Improvement

Submission Author: Anisa Saadatkia

Anisa Saadatkia[1], Parmida Radgoodarzi[2]

1. Farzanegan 3 karaj
2. Farzanegan 3 karaj

Background and Aim : In recent years, nanotechnology has advanced significantly in various fields, including medicine and pharmaceuticals. On the other hand, Alzheimer's disease has become increasingly prevalent, affecting a large number of individuals. Alzheimer's is the most well-known form of dementia, characterized by a progressive and irreversible decline in cognitive functions. This disease gradually impairs memory and speech abilities, and there is currently no definitive cure available. Consequently, researchers are seeking to develop more effective therapeutic strategies to combat this condition. The central nervous system (CNS) is one of the most sensitive microscopic environments in the body, protected by the blood-brain barrier (BBB), a highly complex structure that acts as a barrier to many drugs. However, nanotechnology and nanoparticles have shown considerable potential in medicine, particularly in drug delivery to various organs and medical imaging. Studies have shown that nanotechnology can effectively enhance drug permeability across the BBB.

Methods : In this study, 10 grams of coffee and green tea were extracted using ethanol and water. Subsequently, 10 mL of the prepared extracts of green tea and coffee were separately mixed with 90 mL of 1 mM silver nitrate solution. The resulting mixture was centrifuged at 4000 rpm for 5 minutes, and the precipitate, which contained silver nanoparticles, was collected. Eight male Syrian mice, weighing 20-25 grams, were randomly divided into four groups. The synthesized silver nanoparticles were dissolved in 1 mL of distilled water at a concentration of 50 mg/kg and administered intraperitoneally for four days. The control group received normal saline. In the combined tea and coffee group, equal amounts of the green tea and coffee extracts were used to achieve a concentration of 50 mg/kg. To assess spatial memory and learning, the Morris water maze test was conducted using water, a platform, and geometric cues.

Results : In this study, the time required for mice to locate a hidden platform in water was assessed across different experimental groups. These included a control group and groups injected with silver nanoparticles synthesized from various plant extracts. The results are summarized as follows: Control group: The average time to find the platform decreased from 42 seconds on Day 1 to 17 seconds on Day 4. Green tea group: Mice injected with silver nanoparticles from green tea extract had an average time of 38 seconds on Day 1, reducing to

11 seconds by Day 4. Coffee group: Mice receiving silver nanoparticles from coffee extract averaged 31 seconds on Day 1 and 9 seconds on Day 4. Combination of green tea and coffee group: This group showed the most significant improvement, with an average time of 26 seconds on Day 1 and 7 seconds on Day 4.

Conclusion : The results indicated that silver nanoparticles synthesized using hydroalcoholic extracts of green tea and coffee were effective in enhancing memory. Furthermore, the combination of silver nanoparticles synthesized from both green tea and coffee showed significantly greater efficacy in improving memory compared to the use of either extract alone.

Keywords : Alzheimer's, blood-brain barrier, nanoparticles, green tea, coffee

Count: 194
Abstract ID: 198
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

"The Effect of White Light-Emitting Diode (LED) Therapy on Anxiety, Behavioral, and Cognitive Functions in a D-Galactose/AlCl3-Induced Neurotoxicity Model in Male Wistar Rats"

Submission Author: Elham Ghorbani

Elham Ghorbani[1], Niloofar Abedi[2], Saeed Hajihashemi[3], Maryam Nazari[4]

1. Department of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran
2. Department of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran
3. Department of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran
4. Department of Physiology, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran

Background and Aim : Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by the deposition of amyloid plaques, accumulation of neurofibrillary tangles, synaptic dysfunction, and neuronal cell death, all of which contribute to cognitive and behavioral deficits. Emerging evidence suggests that non-invasive photobiomodulation (PBM), or light therapy, may be effective in various AD models. In this study, we hypothesized that exposure to 40-Hz white light-emitting diode (LED) light could alleviate cognitive and behavioral impairments in a sporadic model of AD.

Methods : A sporadic model of AD was induced in male Wistar rats (220–250g) by co-administration of D-galactose (Dgal; 60 mg/kg, intraperitoneally) and aluminum chloride (AlCl3; 200 mg/kg, oral gavage) for 42 days. The rats were divided into four groups: 1) Control (saline), 2) Saline + Light, 3) Dgal/AlCl3, and 4) Dgal/AlCl3 + Light. The light-treated groups were exposed to 40-Hz LED light (425–550 nm) three times a week for 42 days, with each session lasting 15 minutes. Behavioral assessments, including the Elevated Plus Maze (EPM) for anxiety, Novel Object Recognition (NOR) test for memory, and passive avoidance (PA) test for learning, were conducted after six weeks of treatment to evaluate cognitive and behavioral performance.

Results : In the Dgal/AlCl3 group, there was a significant increase in closed arm duration percentage (CAD%) and a decrease in open arm duration percentage (OAD%) in the EPM test ($p<0.001$), indicating elevated anxiety levels. The discrimination index and novel object index in the NOR test were significantly lower in the Dgal/AlCl3 group compared to the saline group ($p<0.001$), reflecting impaired memory. Furthermore, administration of Dgal/AlCl3 significantly reduced the step-through latency (STL) and increased the total dark compartment (TDC) time in the PA test ($p<0.001$), indicating compromised learning and memory. Remarkably, treatment with 40-Hz white LED light reduced anxiety levels and significantly improved cognitive and behavioral performance in the Dgal/AlCl3 group ($p<0.001$).

Conclusion : This study demonstrates that 40-Hz white LED light therapy can effectively reduce anxiety and improve cognitive and behavioral functions in a sporadic model of Alzheimer's disease. These findings suggest that photobiomodulation holds therapeutic potential for alleviating neurodegenerative symptoms associated with AD. Further investigations are needed to explore the underlying mechanisms and potential clinical applications.

Keywords : Alzheimer’s disease, LED therapy, Dgalactose/AlCl3 toxicity, Neurodegenerative disease

Count: 195
Abstract ID: 430
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Predicting Cognitive Decline in Parkinson's Disease: The Impact of Rapid Eye Movement Sleep Behavior Disorder

Submission Author: Erfan Naghavi

Erfan Naghavi[1]

1. School of medicine, Tehran university of medical sciences, Tehran, Iran

Background and Aim : Parkinson's disease (PD) is the second most prevalent neurodegenerative disease (Cramb et al. 2023). Cognitive decline (CD) in PD is associated with a lower quality of life (Degirmenci et al. 2023). Rapid eye movement sleep behavior disorder (RBD) is recognized as a prodromal indicator of PD (Figorilli et al. 2023). Given the predictive role of RBD in PD (Poewe et al. 2017), this study aims to investigate RBD as a risk factor for CD in PD.
Methods : Data on PD patients were collected at the baseline, and Montreal cognitive assessment (MoCA) scores during the fifth-year visit were gathered using Parkinson's Progression Markers Initiative (PPMI). Participants were categorized based on their MoCA scores: Normal Cognition (NC, MoCA score ≥ 26) and Impaired Cognition (IC, MoCA score < 26). A logistic regression was performed to examine the predictive role of the RBD screening questionnaire (RBDSQ) score in CD while adjusting for confounders.
Results : A total number of 311 PD patients with an average age of 60.79 ± 9.79 were included (Table 1). The fit of the model was statistically significant: $\chi 2$ (5) = 74.59, p value < 0.001 (Table 2). According to the model, the RBDSQ score may possess predictive features for CD in PD (Figure 1). The analysis reveals several noteworthy associations between the predictors and the outcome variable: The coefficient for age is positive (B = 0.10, SE = 0.02); however, it is not statistically significant (p = 0.312), suggesting that age may not be a strong predictor in this context. The coefficient for gender (female) is negative (B = -0.32, SE = 0.32), indicating that being female is associated with lower odds of the outcome, although this finding is not statistically significant (p = 0.255). A significant negative coefficient for education (B = -0.21, SE = 0.05, p < 0.001) suggests that higher levels of education are correlated with decreased odds of the outcome. This measure shows a positive association with the outcome, indicating that higher scores on this scale are linked to increased odds of the outcome (B = 0.02, SE = 0.01, p < 0.001). Similar to MDS-UPDRS III, RBDSQ demonstrates a significant positive relationship with the outcome, further emphasizing its relevance as a predictor in this model (B = 0.18, SE = 0.05, p < 0.001).
Conclusion : These findings indicate that the RBDSQ score in PD serves as a risk factor for the development of CD over a 5-year follow-up period. These findings may provide a potential screening tool for CD, and consider RBD as a prognostic factor.
Keywords : REM sleep behavior disorder; cognition; Parkinson's disease

Count: 196
Abstract ID: 431
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Effectiveness of coenzyme Q10 on learning and memory and synaptic plasticity impairment in aged Aβ-induced rat model of Alzheimer's disease

Submission Author: Masoumeh Hamedi

Masoumeh Hamedi[1], Alireza Komaki[2], Samaneh Safari[3], Hamidreza Komaki[4]

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

Background and Aim : Aging is the major risk factor for Alzheimer's disease (AD), and cognitive and memory impairments are common among the elderly. Interestingly, coenzyme Q10 (Q10) levels decline in the brain of aging animals. Q10 is a substantial antioxidant substance, which has an important role in the mitochondria. We assessed the possible effects of Q10 on learning and memory and synaptic plasticity in aged β-amyloid (Aβ)-induced AD rats.
Methods : In this study, 40 Wistar rats (24–36 months old; 360–450 g) were randomly assigned to four groups (n = 10 rats/ group)—group I: control, group II: Aβ, group III: Q10; 50 mg/kg, and group IV: Q10+Aβ. Q10 was administered orally by gavage daily for 4 weeks before the Aβ injection. The cognitive function and learning and memory of the rats were measured by the novel object recognition (NOR), Morris water maze (MWM), and passive avoidance learning (PAL) tests. Finally, malondialdehyde (MDA), total antioxidant capacity (TAC), total thiol group (TTG), and total oxidant status (TOS) were measured.
Results : Q10 improved the A?-related decrease in the discrimination index in the NOR test, spatial learning and memory in the MWM test, passive avoidance learning and memory in the PAL test, and long-term potentiation (LTP) impairment in the hippocampal PP-DG pathway in aged rats. In addition, A? injection significantly increased serum MDA and TOS levels. Q10, however, significantly reversed these parameters and also increased TAC and TTG levels in the A?+Q10 group.
Conclusion : Our experimental findings suggest that Q10 supplementation can suppress the progression of neurodegeneration that otherwise impairs learning and memory and reduces synaptic plasticity in our experimental animals. Therefore, similar supplemental Q10 treatment given to humans with AD could possibly provide them a better quality of life.
Keywords : Alzheimer's disease · Coenzyme Q10 · Hippocampus · Synaptic plasticity · Dentate gyrus · Amyloid-beta · Aging

Count: 197
Abstract ID: 194
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Uncovering the Power of NK Cells in the Fight Against Alzheimer's Disease

Submission Author: Rahil Mostofi

Rahil Mostofi[1], Mohammad Saleh Safari[2]

1. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.
2. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.

Conclusion : NK cells are emerging as important players in Alzheimer's disease pathology, with a complex role in modulating immune responses in the brain. While they may help in removing toxic protein aggregates, their pro-inflammatory actions may worsen neurodegeneration. Future research should focus on regulating NK cell activity as a therapeutic strategy to balance neuroprotection and neuroinflammation in Alzheimer's disease treatment.

Keywords : NK Cell, Alzheimer's Disease, Treatment.

Count: 198
Abstract ID: 442
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Chronic inhibition of the mediodorsal thalamic nitric oxide system affected the prefrontal cortical function in a streptozotocin-induced Alzheimer's rat model

Submission Author: Ali Yousefi

Ali Yousefi[1], Ameneh Rezayof[2], Mohammad-Reza Abolghasemi-Dehaqani[3], Ladan Delphi[4]

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 Machine Intelligence and Robotics, School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
4. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran

Background and Aim : The mediodorsal thalamus (MD) contributes to memory formation via the nitric oxide (NO) signaling pathway. The MD is reciprocally connected with the prefrontal cortex (PFC) to regulate many cognitive processes. Evidence suggests that the MD functions and the reciprocal MD-PFC connections may be affected in people with Alzheimer's disease (AD). It seems that altered information transfer between MD and PFC may be involved in AD symptoms, including cognitive control deficits. Considering that electrical hyperactivity PFC was suggested to be associated with AD, the emergence of interictal epileptiform discharges (IEDs) was reported in the early stages of the disease. The present study aimed to investigate the effects of chronic inhibition of the MD nitric oxide system in an ICV-STZ-animal model using a passive avoidance learning (PAL) task in adult male Wistar rats.

Methods : Intracerebroventricular (ICV) injection of streptozotocin (STZ), a nitrosamine-related compound, used as an animal model to mimic the cognitive dysfunction associated with sporadic AD. Since local field potentiation (LFP) is an electrophysiological method to record neural activity, this method was also used to record PFC electrical activity after measuring memory formation under ICV administration of STZ (3 mg/kg/10 µl/rat; twice on surgery day and 48 h after) following the blockade of the MD NO system. The animals (200-230 g) were anesthetized with an intraperitoneal injection of ketamine and xylazine to place into a stereotaxic instrument for cannulations of the lateral ventricle and the MD simultaneously. Stainless steel electrodes were also implanted within the PFC, with screws placed in the cerebellum serving as reference and grounding sites. The electrodes were securely affixed to the skull. Thus, LFP was recorded to evaluate IED rates in the PFCs for 15 to 20 min. Data acquisition occurred at a sampling rate of 2000 Hz, employing an insulated recording system. In the experimental groups in which the animals received ICV-STZ injection, L-NAME, as an inhibitor for NO synthesis, was microinjected into the MD (0.5 and 1 µg/rat) five times from

the 5th to 13th days, every other day. Then, memory retrieval was measured based on the step-through latency (STL).

Results : The results showed that twice ICV injection of STZ significantly impaired memory formation. Chronic intra-MD microinjection of L-NAME significantly improved memory impairment in the streptozotocin-induced AD rat model. Additionally, LFP recordings indicated that the IEDs rate was back to normal levels compared to twice the ICV injections of STZ. In other words, IEDs have a negative correlation with STL in the PAL task, while twice the ICV-STZ increased IEDs, and interestingly chronic intra-MD microinjections of L-NAME resulted in its reduction.

Conclusion : Taken together, it can be concluded that the chronic inhibition of the MD NO system improved the amnestic effects of ICV-STZ by counteracting STZ-induced-PFC hyperactivity to restore to its normal levels.

Keywords : Streptozotocin; Memory formation; MD-PFC connection; L-NAME; Rat(s)

Count: 199
Abstract ID: 294
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Navigating Words: The Role of Basal Ganglia in Word Retrieval Among Parkinson's Disease Patients

Submission Author: Melika Kazembeigi

Melika Kazembeigi[1], Erfan Naghavi[2], Reyhane Khakbaz Moghaddam[3], Melika Arab Bafrani[4], AmirHossein Kamroo[5]

1. Payamenoor University, South Tehran Branch
2. School of medicine, Tehran university of medical sciences
3. School of Medicine, Islamic Azad University, Tehran Medical Branch
4. Melika.arab92@gmail.com Students' Scientific Research Center (SSRC), Tehran University of Medical Sciences, Tehran, Iran 00 00000239835844
5. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran.

Background and Aim : Parkinson's disease (PD) is the second most prevalent neurodegenerative disorder. Individuals experiencing semantic fluency disorder struggle to produce words belonging to specific categories within a designated timeframe. This impairment in PD is linked to deficiencies in semantic memory, challenges in cognitive set-shifting, and other retrieval processes. The basal ganglia (BG) serve as essential regulators and coordinators of voluntary muscle activity. A significant portion of the output signals from the BG is directed toward the prefrontal regions, including the prefrontal cortex (PFC), which is vital for speech production. Therefore, it is plausible that the BG contribute to verbal and semantic fluency through their neuronal pathways. This study seeks to explore the relationship between dopaminergic function in the BG and semantic fluency in PD patients, both at the baseline and after four years of follow-up.

Methods : Using data from the Parkinson's Progression Markers Initiative (PPMI), we gathered information on PD patients and healthy controls (HCs) at both baseline and after four years of follow-up. This included the dopamine transporter scan (DaTScan) specific binding ratio (SBR) for the bilateral caudate, putamen, and anterior putamen nuclei, along with semantic fluency data across three categories: animals, vegetables, and fruits. Additionally, we combined the scores from these three categories to formulate a final semantic score for each participant. Participants with incomplete data were excluded from the analysis. A Kendall correlation analysis was conducted to assess the relationship between semantic fluency and dopaminergic function in the BG, while controlling for age, sex, and years of education.

Results : At baseline, the study included 407 PD patients (average age = 61.58) and 162 HCs (average age = 60.58). By the fourth year, there were 289 PD patients (average age = 65.28) and only one HC, who was excluded from the analysis. No correlations were observed between semantic fluency and dopaminergic function in the BG for either HCs or PD patients at baseline. However, by the fourth year, a relationship emerged between semantic fluency and

the SBR in the right putamen (r = 0.117, p = 0.003), left putamen (r = 0.084, p = 0.033), and right anterior putamen (r = 0.108, p = 0.006) among PD patients.

Conclusion : These results suggest that the semantic fluency is linked to increased dopaminergic function of bilateral putamen and right anterior putamen nuclei in PD patients by the fourth year of follow-up. The BG play a critical role in regulating cognitive processes, including response inhibition and semantic fluency, particularly in individuals with PD. In this population, motor symptoms often co-occur with cognitive deficits, notably in executive functions such as working memory and cognitive flexibility. Dysfunction in the BG disrupts connections with the frontal cortex, further complicating access to language. Additionally, degeneration of dopaminergic neurons and dopamine deficiency adversely affects both motor and cognitive functions, including word retrieval efficiency. Consequently, semantic fluency serve as a vital tool for assessing cognitive decline and guiding therapeutic interventions in PD, underscoring the complex interplay between motor and cognitive domains in PD.

Keywords : semantic fluency; basal ganglia; Parkinson's disease

Count: 200
Abstract ID: 700
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Multiple Sclerosis and Flavonoids

Submission Author: Armina Bahador

Armina Bahador[1], Nazem Ghasemi[2]

1. MSc student of Anatomical sciences, Isfahan University of Medical Sciences
2. Assistant professor, Isfahan University Of Medical Sciences

Conclusion : Multiple sclerosis (MS) is a chronic autoimmune disease affecting the central nervous system (CNS). Characterized by inflammation and demyelination of nerve fibers, MS can lead to a wide range of neurological symptoms, including motor impairment, sensory disorders, and cognitive dysfunction. While the exact etiology of MS remains unclear, a complex interaction of genetic and environmental factors is believed to contribute to development of this. Genetic susceptibility, combined with exposure to viral infections, vitamin D deficiency, and smoking, may trigger an autoimmune response that targets the myelin sheath surrounding nerve cells. Conventional treatments for MS focus on managing symptoms and modulating the immune system firstly. Although, these therapies often fail to halt disease progression and may have significant side effects. Consequently, there is a growing interest in exploring alternative therapeutic approaches, such as the use of natural compounds like flavonoids, which possess potent antioxidant and anti-inflammatory properties. A comprehensive understanding of MS, including its pathogenesis, etiology, diagnosis, and treatment, is essential for neurologists to provide optimal care for patients. This review aims to provide an up-to-date overview of the current state of knowledge about MS, highlighting the need for further research to develop more effective and safe therapeutic interventions.

Keywords : Multiple Sclerosis, Autoimmune Disease, Demyelination, Neuroinflammation

Count: 201
Abstract ID: 261
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Unraveling the Genetic Landscape of Neurodegenerative Diseases: Implications for Diagnosis and Treatment

Submission Author: Kiana Hajavi

Kiana Hajavi[1]

1. cellular and mulcular biology azad university

Conclusion : The exploration of genetics in the context of neurodegenerative diseases offers significant potential for enhancing understanding, diagnosis, and treatment of these conditions. By sharing insights at the congress, we aim to inspire collaborative efforts that bridge genetic research and clinical practice. Ultimately, our goal is to contribute to the development of personalized medicine approaches that can profoundly impact the lives of those affected by neurodegenerative diseases

Keywords : neurosience, brain ,neurodegenerative diseases,biomarkers,genetics,

Count: 202
Abstract ID: 676
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Reliable Biomarkers in MSC Therapy for Neurological Diseases: A Scoping Review

Submission Author: Shahrzad Najafi

Shahrzad Najafi[1], Parizad Najafi [2], Sajjad Mollaei[3], Sahar Ghorbanikalateh[4], Sahel Ghorbanikalateh[5], Amir Reza Boroumand[6], Najmeh Kaffash Farkhad, Jalil Tavakol Afshari[7], Kimia Zare, Amir Shokri, Amir Mahdi Davari[8], Sajad Sahab-Negah[9]

1. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Mashhad University of Medical Sciences, Department of Physiology, Mashhad, Iran.
4. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
5. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
6. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
7. Immunology Research Center, Department of Immunology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
8. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
9. 1.Department of Neuroscience, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. 2.Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Conclusion : Abstract Importance: Neurodegenerative diseases like Amyotrophic Lateral Sclerosis (ALS), Parkinson's Disease (PD), and Ataxia are characterized by the progressive loss of neurons in the central nervous system, leading to severe symptoms and functional impairments. Mesenchymal Stem Cell (MSC) therapy offers a promising treatment approach for these conditions. However, identifying reliable biomarkers to evaluate the effectiveness of MSC therapy remains critical for advancing regenerative medicine. Objective: This scoping review aims to identify and assess potential biomarkers used in evaluating MSC therapy in neurodegenerative diseases, specifically focusing on ALS, PD, and Ataxia. The study examines both clinical and immunological markers to determine their relevance and reliability in assessing therapeutic outcomes. Evidence Review: A systematic literature search was conducted following PRISMA-ScR guidelines across multiple databases, including PubMed, SCOPUS, Cochrane, and Web of Science. The review focused on clinical and experimental articles that evaluated biomarkers in response to MSC therapy for ALS, PD, and Ataxia. Data extraction and quality assessment were performed on the 49 studies meeting the inclusion criteria out of 2760 initially retrieved articles. Findings: The analysis revealed that clinical parameters were the most frequently evaluated biomarkers, followed by paraclinical and

immunological markers. Key biomarkers identified across ALS, PD, and Ataxia studies included TNF-α, IL-1β, VEGF, TGF-β, IL-10, IL-6, GDNF, NFL, MCP-1, and iNOS. These biomarkers showed potential in monitoring disease progression and treatment response. Conclusions and Relevance: Accurate and reliable biomarkers are essential for the diagnosis, monitoring, and treatment of neurodegenerative diseases. This review highlights the significance of integrating clinical assessments with immunological biomarkers for a comprehensive evaluation of MSC therapy outcomes. The findings emphasize the need for standardization and the consideration of individual variability to enhance personalized medicine in treating neurodegenerative diseases. Future strategies should focus on utilizing a biomarker panel for more precise disease and treatment assessments.

Keywords : Keywords: ALS, Parkinson's disease, Ataxia, Mesenchymal Stem Cells, diagnostic biomarkers.

Count: 203
Abstract ID: 496
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Silent Struggle: Exploring Autonomic Imbalance in Parkinson's Disease – Pathophysiology, Diagnosis, and Future Therapeutic Directions

Submission Author: Hadi Moatamedjahromi

Hadi Moatamedjahromi[1]

1. student research committe, Shiraz university of medical sciences, Shiraz, Iran

Conclusion : Back ground Parkinson's disease (PD) is a neurodegenerative disorder that not only affects motor function but also leads to autonomic dysfunction, disrupting vital processes like heart rate and digestion. Symptoms such as orthostatic hypotension, constipation, and urinary issues are common but often overlooked. This underscores the need for better recognition and management of autonomic dysfunction in PD. Method Research materials were extracted from 19 articles using the following data base: Google scholar & Science Direct, by using the key words: Parkinson disease, autonomic degeneration, autonomic imbalance Results Autonomic dysfunction is common in Parkinson's disease (PD), significantly affecting quality of life. Symptoms such as orthostatic hypotension, constipation, urinary dysfunction, and abnormal sweating often go undiagnosed due to overlap with motor symptoms. The pathophysiology of these dysfunctions involves both central and peripheral mechanisms. Central mechanisms include degeneration of dopaminergic neurons in the substantia nigra and disruption of autonomic centers in the brainstem, such as the hypothalamus and medulla, which control vital autonomic functions. Additionally, alpha-synuclein deposition in these regions impairs neuronal signaling, affecting autonomic regulation of heart rate, blood pressure, and other functions. Neurotransmission disturbances are key in autonomic imbalance on a molecular level. Dopaminergic loss disrupts the coordination between the sympathetic and parasympathetic systems, leading to exaggerated or insufficient responses. A reduction in norepinephrine release due to degeneration of sympathetic neurons contributes to orthostatic hypotension and impaired sweating. Abnormal cholinergic activity in the parasympathetic system contributes to gastrointestinal symptoms like constipation and urinary issues. Neuroinflammation also plays a crucial role in PD-related autonomic dysfunction. Activated microglia and astrocytes release pro-inflammatory cytokines that exacerbate neuronal damage in autonomic centers, further impairing regulation of autonomic processes. Peripheral inflammation, especially in the enteric nervous system, may also contribute to gastrointestinal dysfunction. Current treatments focus on symptom management, targeting issues like orthostatic hypotension and gastrointestinal disturbances with medications such as midodrine and laxatives. However, no disease-modifying therapies exist to address the underlying pathophysiological mechanisms. More research is needed to understand better the role of neurotransmission, signaling pathways, and inflammation in autonomic dysfunction and to develop targeted therapeutic strategies. Conclusion Autonomic dysfunction is a common and impactful feature of Parkinson's disease, contributing to significant patient morbidity and

reduced quality of life. While current treatments focus on symptom management, they do not address the underlying pathophysiological mechanisms, which involve both central and peripheral neurodegeneration. For now, a holistic approach to Parkinson's disease care—considering both motor and non-motor symptoms—is essential to improve patient outcomes. Further exploration into early detection and novel treatment options for autonomic dysfunction is crucial for enhancing care for Parkinson's patients.

Keywords : Parkinson disease; autonomic degeneration; autonomic imbalance

Count: 204
Abstract ID: 174
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

New insight into the mechanism of Aripiprazole effects in stress-induced depressive disorders, through modulation of Cacna1c and GR interactions

Submission Author: Somayeh Dashti

Somayeh Dashti[1], Arezo Nahavandi[2]

1. Department of physiology, Iran University of medical sciences, Tehran, Iran
2. Department of Physiology, Faculty of Medicine, Iran University of Medical Science, Tehran, Iran

Background and Aim : Recently low doses of aripiprazole, a novel antipsychotic drug, has been approved as an adjunctive therapy for Treatment Resistant Depression (TRD). Beside the involvement of calcium signaling dysregulations in the pathophysiology of depression, there is some evidence of aripiprazole effects on intracellular calcium levels. Recently associations of polymorphisms in the CACNA1C gene, which encodes Cav1.2 (α1c subunit of L-type calcium channel), with major psychiatric disorders have been revealed, and suggested this channel as a novel therapeutic target for stress-related disorders. Therefore, for the first time we investigate the impacts of aripiprazole on CACNA1C expression

Methods : Using Chronic Unpredictable Mild Stress (CUMS), we examined the effects of Aripiprazole on Cacna1c overexpression induced by stress. Also, we investigated some other depression-associated genes involved in calcium signaling: GR (glucocorticoid receptor), BDNF, and TrkB. In addition, the effects of aripiprazole on Gap43, a plasticity marker, and dopamine transporter (DAT), which are critically changed in depression, have been assayed.

Results : Our data confirmed that aripiprazole could restore anxiety and depressive-like behaviors, high plasma MDA and IL-6 following CUMS. Also, the significant impacts on overexpressed CACNA1C, downregulated GR, BDNF, and TrKB, in both PFC and hippocampus have been shown. Furthermore, the decreased Gap43 and DAT expression in CA3 hippocampal area following chronic stress, restored by aripiprazole.

Conclusion : Our results suggest that CACNA1C overexpression induced by chronic stress is restored by aripiprazole, and effects on GR, BDNF, and TrKB expression accompany this effect. In addition, this effect can be related to DAT overexpression and restored Gap43 deficits caused by chronic stress. These findings suggest some new mechanisms under the effects of aripiprazole in depressive disorders treatments.

Keywords : Aripiprazole, Depressive disorders; Chronic stress; Calcium; LTCCs; CACNA1C; GR; BDNF; TrKB, Synaptic plasticity

Count: 205
Abstract ID: 166
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Pomegranate Seed Oil Can Reduce Density of Amyloid Plaques in the Hippocampal CA1 Area of Male Rat Model of Alzheimer's disease

Submission Author: Emsehgol Nikmahzar

Emsehgol Nikmahzar[1], Mehrdad Jahanshahi [2], Vahid Khori [3], Fateme Yazdani [4], Elsana Jahanshahi[5], Gozal Bahlakeh [6]

1. Student Research Committee, Golestan University of Medical Sciences, Gorgan, Iran
2. Neuroscience Research Center, Department of Anatomy, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
3. Ischemic Disorders Research Center, Golestan University of Medical Sciences, Gorgan, Iran
4. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
5. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran
6. Neuroscience Research Center, Golestan University of Medical Sciences, Gorgan, Iran

Background and Aim : Neurodegenerative diseases, such as Alzheimer's disease (AD) yet have no definitive treatment. Extracellular accumulation of Amyloid-Beta (Aβ) plaques and formation of intracellular neurofibrillary tangles are the two pathological symptoms of AD. Pomegranate seed oil has been found to exhibits antioxidant, anti-inflammatory, and neuroprotective effects. Studies have shown that pomegranate juice decreases accumulation of soluble Aβ42 and amyloid deposition in the mice hippocampus. Additionally, pomegranate extract alter levels and ratio of the Aβ42 and Aβ40 peptide in an aged transgenic AD animal model. However, the impact of pomegranate seed oil on the number of plaques in the rat model of AD remains unexplored. Hence, this research investigated the effect of pomegranate seed oil on density of Aβ plaques in the rat hippocampal CA1 area both before and after intraperitoneal (IP) injection of scopolamine.

Methods : Fifty-six Adult Male Wistar rats were randomly assigned into 7 groups, with 8 rats in each group: Control (without receiving drug), Sco (received scopolamine: 3 mg/kg, IP) + Saline, Sco + PSO (received pomegranate seed oil: 0.32 and 0.64 mg/kg, IP, for 14 days), Saline + Sco and PSO (received pomegranate seed oil: 0.32 and 0.64 mg/kg, IP, for 14 days) + Sco groups. Following histological processing, Congo red staining were used for identify the Aβ plaques in the hippocampal CA1 area. The number Aβ plaques in the hippocampal CA1 area was counted within a 30000 μm2 area.

Results : Scopolamine injection led to a significant increase in the density of Aβ plaques in Saline + Sco and Sco + Saline rats when compared to the control group ($P<0.0001$). However, pomegranate seed oil administration both after and before scopolamine injection significantly decreased the density of Aβ plaques in the hippocampal CA1 area in comparison to the Sco + Saline and Saline + Sco groups ($P<0.0001$). Notably, treatment with pomegranate seed oil at dose of 0.64 mg/kg was most effective in decreasing the Aβ plaques density in the hippocampal CA1 area.

Conclusion : Pomegranate seed oil demonstrates potential protective and therapeutic effects with reducing the Aβ plaques density in the rat hippocampal CA1 area. Therefore, pomegranate seed oil could be a beneficial intervention for AD

Keywords : Pomegranate seed oil; Hippocampus; CA1 area; Amyloid plaques

Count: 206
Abstract ID: 441
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Identification of miRNAs affecting BACE1 and GSAP genes as a biomarker for early diagnosis of sporadic Alzheimer's Disease

Submission Author: Nazanin Hajjari

Nazanin Hajjari[1], Mehdi Mehdizadeh[2], Saeed Sadigh-Eteghad[3], Ali Shahbazi[4]

1. Department of Audiology, Faculty of Rehabilitation Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Cellular and Molecular Research Center, Department of Anatomy, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Neurosciences, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is a progressive neurodegenerative disorder and early diagnostic biomarkers for the detection of that in the pre-dementia phase are vital. Beta-secretase (BACE1) and gamma-secretase activating protein (GSAP) are pivotal enzymes in cleavage of amyloid precursor protein (APP) and beta-amyloid (Aß) formation as a cornerstone of Alzheimer's diseases (AD) pathology. The main goal of this study was Identification of miRs in the blood serum of Alzheimer's patients with possible interaction with BACE1 and/or GSAP and introduce a probable novel early diagnostic marker for AD.

Methods : Computational analysis candidate miR-4422 and miR-3714 with possible interaction with BACE1 and/or GSAP. The expression level of two miRs was measured in the blood serum of 20 patients with mild to moderate AD (58-71 years old) and 15 healthy subjects (58-73 years old). miR-4422 showed reduced levels in the serum of AD patients. miR-3714 was excluded from the study due to no significant difference in expression level between the two groups. Thus, in the second phase of the study, the effect of miR-4422 interaction with BACE1 and GSAP functionally evaluated by in vitro experiments using dual-luciferase assays, western blotting, and Immunocytochemistry.

Results : Our study revealed a significant decreased level of miR4422 in AD patients in comparison with healthy controls ($p = 0.018$) while no significant difference was observed for miR-3714. Luciferase assay demonstrated that miR-4422 markedly suppresses the expression of BACE1 and GSAP by directly targeting the 3′UTR of BACE1 and GSAP mRNA in HEK293T cells. Also, western blotting and immunocytochemistry confirmed the regulatory role of miR-4422 on the BACE1 and GSAP genes. miR-4422 significantly decreased BACE1 and GSAP protein expression in SH-SY5Y and A549 cells, respectively. Moreover, miR-4422-inhibitor reversed the expression process in both cell lines.

Conclusion : Our data suggest that miR-4422 is an important regulator of both BACE1 and GSAP genes and could represent a novel potential serum biomarker or therapeutic target in AD.

Keywords : miR-4422, BACE1, GSAP, Alzheimer's disease, biomarker

Count: 207
Abstract ID: 690
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Exploring melatonin's therapeutic effects via the SIRT1 pathway in neurodegenerative diseases

Submission Author: Zeinab Vahidinia

Zeinab Vahidinia[1]

1. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran

Conclusion : Melatonin is a neuroregulator hormone that has free radical scavenger, strong antioxidant, anti-inflammatory, and immunosuppressive actions. These major properties of melatonin can play an important role in the pathophysiological mechanisms of neurological diseases.The neuroprotective effects of melatonin are mediated through several molecular pathways, with one significant pathway involving Sirtuin-1 (SIRT1). SIRT1, a well-studied member of the sirtuin family in mammals, functions as a deacetylase that relies on nicotinamide adenine dinucleotide (NAD+). It translocates between the cytoplasm and the nucleus, removing acetyl groups from histones and other proteins, which influences essential cellular functions such as survival, metabolism, growth, aging, and stress resistance. Notably, melatonin has been identified as a strong regulator of SIRT1, impacting neuroinflammation, oxidative stress, apoptosis, and autophagy in various models of neurological diseases. Despite these promising findings, research on the role of SIRT1 in mediating the therapeutic effects of melatonin in neurodegenerative conditions remains limited. This review focuses on the pharmacological impacts of melatonin in neurodegenerative diseases, emphasizing the critical role of the SIRT1 pathway as a key regulatory mechanism.

Keywords : Melatonin; sirtuin-1 (SIRT1); Neurodegenerative disorders

Count: 208
Abstract ID: 111
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Aromatherapy for the brain: Lavender's healing effect on epilepsy, depression, anxiety, migraine, and Alzheimer's disease: A review article

Submission Author: Shekofeh Bagheri

Shekofeh Bagheri[1], Nazanin Hatami Bavarsad[2], Masoumeh Kourosh-Arami[3], Alireza Komaki[4]

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

Conclusion : Neurological diseases affect the nervous system, including the brain, spinal cord, cranial nerves, nerve roots, autonomic nervous system, neuromuscular junctions, and muscles. Herbal medicine has long been used to cure these diseases. One of these plants is lavender, which is composed of various compounds, including terpenes, such as linalool, limonene, triterpenes, linalyl acetate, alcohols, ketones, polyphenols, coumarins, cineole, and flavonoids. In this review, the literature was searched using scientific search engines and databases (Google Scholar, Science Direct, Scopus, and PubMed) for papers published between 1982 and 2020 via keywords, including review, lavender, and neurological disorders. This plant exerts its healing effect on many diseases, such as anxiety and depression through an inhibitory effect on GABA. The anti-inflammatory effects of this plant have also been documented. It improves depression by regulating glutamate receptors and inhibiting calcium channels and serotonergic factors, such as SERT. Its antiepileptic mechanism is due to an increase in the inhibitory effect of GABA and potassium current and a decrease in sodium current. Therefore, many vegetable oils are also used in herbal medicine. In this review, the healing effect of lavender on several neurological disorders, including epilepsy, depression, anxiety, migraine, and Alzheimer's disease was investigated. All findings strongly support the traditional uses of lavender. More clinical studies are needed to investigate the effect of the plants' pharmacological active constituents on the treatment of lifethreatening diseases in humans. The limitations of this study are the low quality and the limited number of clinical studies. Different administration methods of lavender are one of the limitations of this review.

Keywords : Neurological disorders Alzheimer's disease Lavender Anxiety Depression Epilepsy Migraine

Count: 209
Abstract ID: 487
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Diagnostic potential of exosomal microRNAs in Alzheimer's disease

Submission Author: Zahra Abroodi

Zahra Abroodi[1], Ali Reza Lotfi[2], Mehdi Mehdizadeh[3]

1. Department of Anatomical Sciences, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Tissue Engineering Department, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran.
3. cellular and molecular research center, faculty of medicine, department of anatomy, Iran university of medical sciences

Conclusion : Introduction: Alzheimer's disease (AD) is the most common neurodegenerative disease in the elderly people. So far, many diagnostic biomarkers have been identified for the diagnosis of AD, but more efforts are being made to find new biomarkers that are easily and less invasively available to diagnosis the disease before irretrievable neurological changes take place. Exosomes and microRNAs (miRNAs) are considered as important risk factors in the pathogenesis of AD. Exosomes are nanocarriers derived from endosomes released from various types of cells. They play an important role in transporting important proteins, mRNAs and miRNAs to the adjacent and/or farther cells. Therefore, they are effective in maintaining physiological or creating pathological conditions. miRNAs are small noncoding endogenous RNA sequences that regulate protein expression. A lot of diseases are caused by changes in the expression of the miRNAs which lead to dysregulation of the important genes and pathways. Methods: Data was collected by searching Scopus, PubMed, and Google Scholar databases. Articles selected for this review reported the recent advances about exosomal miRNAs and their potential to be used as diagnostic biomarkers in AD which conducted during the years 2000 to 2024. Results: Evidence from different studies showed that exosomal miRNAs regulate the expression and function of amyloid precursor proteins (APP) and tau proteins. These data revealed that inefficient exosomal miRNAs effect on the progressive course of the AD. Conclusion: Therefore, it can be concluded that exosomal miRNAs derived from biological fluids are accessible sources which have diagnostic value for neurodegenerative diseases including AD. In this review, the recent advances about exosomal miRNAs and their potential to be used as diagnostic biomarkers in AD are summarized.

Keywords : Alzheimer's Disease, exosome, microRNA

Count: 210
Abstract ID: 44
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigating of the Effect of Thalamotomy Surgery on Working Memory

Submission Author: Shahrzad Mohammadpour Esfahan

Shahrzad Mohammadpour Esfahan[1], Mohammad-Hossein H. K. Nili[2], Abdol-Hossein Vahabie[3], Mehdi Sanayei[4], Abolhassan Ertiaei[5], Mohammad-Reza A. Dehaqani[6], Ehsan Rezayat[7]

1. Department of Psychology, Faculty of Psychology and Education, University of Tehran, Tehran, Iran
2. School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
3. School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
4. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
5. Department of Neurosurgery, Sina Hospital, Tehran University of Medical Science, Tehran, Iran
6. School of Electrical and Computer Engineering, College of Engineering, University of Tehran, Tehran, Iran
7. Department of Psychology, Faculty of Psychology and Education, University of Tehran, Tehran, Iran

Background and Aim : As part of the cognitive system, working memory stores information temporarily and uses it for active processing. Parkinson's disease is characterized by symptoms such as tremors and muscle stiffness. One of the problems that arise in people with Parkinson's is a decrease in working memory. Thalamotomy surgery is used as a treatment method to reduce movement symptoms in this disease.

Methods : In this study, the focus is on the effect of this surgery on the working memory of Parkinson's patients. For this purpose, the working memory of 21 patients with Parkinson's who underwent thalamotomy surgery has been compared with a group of healthy people of the same age. Using the psychophysical test, the visual working memory performance of these patients was measured and the test results were compared with the healthy control group. In this research, the focus is on evaluating the sources of errors in patients' working memory.

Results : The results of the study show that the accuracy of working memory in Parkinson's patients who had thalamotomy surgery is lower than the control group. But there is no significant difference in answering the working memory test using guessing.

Conclusion : The precision of visual working memory in PD patients who have undergone thalamotomy surgery is lower than the control group.

Keywords : working memory, Parkinson's disease, thalamotomy

Count: 211
Abstract ID: 69
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Bromelain decreases oxidative stress and Neuroinflammation and improves motor function in adult male rats with cerebellar Ataxia induced by 3-acetylpyridine

Submission Author: Reza Bahar

Reza Bahar[1], Abbas Aliaghaei[2], Maryam Jahani Chegeni[3]

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
3. Medical Radiation Research Center, Central Tehran Branch, Islamic Azad University, Tehran, Iran

Background and Aim : Bromelain is a plant-based molecule with antioxidant, antithrombotic, anticancer, and anti-inflammatory properties. Bromelain has been shown to reduce the release of inflammatory cytokines. This study aimed to determine whether bromelain can prevent ataxia in rats caused by 3-acetylpyridine (3-AP).

Methods : Thirty-six albino rats were divided into the control, 3-AP, and 3-AP + Brom groups. In the 3-AP + Brom group, bromelain was injected intraperitoneally at 40 mg/kg daily for 30 days. Various techniques such as rotarod, electromyography (EMG), elevated plus maze, IHC, and Sholl analysis were used to evaluate the possible effects of bromelain on cerebellar neurons and glial cells.

Results : The results demonstrated significant improvements in most of the 3-AP + Brom, including motor coordination, neuromuscular response, anxiety, oxidative capacity, microgliosis, astrogliosis, cell death, and morphological variables compared to the 3-AP group.

Conclusion : The mechanism of action of bromelain in restoring cerebellar ataxia needs further investigation, but it may be a candidate to help restore degeneration in animals with ataxia.

Keywords : 3-acetylpyridine; Bromelain; Cerebellar ataxia; Neuroinflammation; Oxidative stress

Count: 212
Abstract ID: 201
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Investigation and comparison of the effects of inhibiting NF-κB and HCN ion channels on behavioral changes caused by beta-amyloid injection in the frontal cortex of laboratory rats

Submission Author: Zahra Soleimani

Zahra Soleimani[1], Shima Davoudi[2], Mona Rahdar[3], Narges Hosseinmardi[4], Mohammad J. Eslamizade[5], Mahyar Janahmadi[6]

1. Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Neurophysiology research center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Neuroscience Research Center and Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Neuroscience Research Center and Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
6. Neuroscience Research Center and Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is one of the most common neurodegenerative diseases. Neuroinflammation has been considered as one of the important risk factors as the cause of AD. Inflammatory mediators activate various signaling pathways in which NF-kB signaling plays a significant role. Ion channels are a group of proteins mainly expressed on the cell membrane and shape neuronal excitability. The expression rate, distribution, and activity of ion channels affect the function and excitability of neurons. HCN channels are A bunch of Potassium channels that membrane hyperpolarization leads to activating them. Also, there is a close relationship between increasing the activity of these ion channels and neuroinflammation. This study used JSH-23 alone or in combination with ZD7288 to block NF-kB and HCN channels, respectively, and then behavioral analyses were assessed using MWM and EPM tests. Furthermore, we compared the therapeutic potential of inhibiting NF-kB, HCN channels, or both in an experimental model of AD.

Methods : AD model was developed in rats with amyloid-β peptides 1-42 dissolved in normal saline at a concentration of 10ng/µl. For the intracortical injection of Aβ and cannula implantation in the right lateral ventricle for later intracerebroventricular (I.C.V.) injections, animals were anesthetized and Aβ solution was bilaterally injected into the frontal cortices (3 µl for each side). For the control group, the same volume of sterile normal saline was injected with the same method. JSH-23 (3.5 µg/µl/day), ZD7288 (5 µg/µl/day), or both (with 30 min interval) were administered via the implanted cannula, After a 9 day-recovery period, and continued until the day of behavioral probe tests. The elevated plus maze test has been used to

investigate anxiety-like behaviors. The Morris water maze test was used to investigate spatial learning and memory.

Results : In the elevated plus maze, our findings suggest that injection of A? peptides into the frontal cortices elevates anxiety-like behaviors in rats, at least partly, mediated through hyper-activation of NF-?B signaling. Additionally, our data indicate that inhibition of NF-?B or in combination with HCN channel inhibitor has a rescuing effect on anxiety levels in A?-injected rats. In the MWM test, our results suggest that inhibition of NF-?B or HCN channels has a rescuing effect on spatial learning in A?-injected rats. Furthermore, evidence from combination therapy raises the possibility that beneficial cognitive effects of inhibiting NF-?B are primarily mediated through HCN channels

Conclusion : In summary, our study indicates that inhibition of NF-κB signaling at its nuclear translocation level with JSH-23 and inhibition of HCN channels with ZD7288 have beneficial cognitive effects, like rescuing anxiety-like behaviors and spatial memory in Aβ-injected rats. Furthermore, the combination of JSH-23 and ZD7288 has positive effects on rescuing anxiety-like behaviors and spatial memory improvement. It can show the relation between the NF-KB pathway and HCN channels in Alzheimer's disease (AD) pathology and inhibition of these pathways, can be a therapeutic mechanism for curing AD in the future.

Keywords : Alzheimer's disease;NF-κB;HCN channels;JSH-23;ZD7288

Count: 213
Abstract ID: 727
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

"The Complex Interplay Between Multiple Sclerosis and Alzheimer's Disease: Risks, Protections, and Therapeutic Insights"

Submission Author: Hamideh Asadinezhad

Hamideh Asadinezhad[1]

1. ph.D student of physiology, Department of physiology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Conclusion : Multiple sclerosis (MS) and Alzheimer's disease (AD) are two distinct neurological disorders that may share some connections in their pathogenesis and clinical manifestations. Recent research suggests a complex relationship between these conditions, with both potential protective and risk-enhancing effects. Studies have shown that MS patients exhibit a significantly lower amyloid pathology typical of AD compared to non-MS controls, with 50% lower amyloid probability scores. This finding suggests a possible protective effect of MS against AD development. The underlying mechanisms may involve shared environmental factors, such as viral infections like HSV-1, and common pathological processes, including demyelination. However, other research indicates that MS patients have an increased risk of developing dementia, including AD. A population-based study in Korea found that MS patients had a 2.23 times higher risk of developing AD compared to matched controls. This elevated risk may be attributed to the chronic inflammation and neurodegeneration associated with MS. The cognitive impairment profiles in MS and AD differ, with MS patients showing greater relative impairment in attention, incidental memory, and psychomotor functions, while AD patients exhibit more severe deficits in learning, memory, and verbal skills. These distinctions support the concept of "white matter" versus "gray matter" dementia. Interestingly, recent investigations have explored the potential of MS treatments for AD therapy. A study on human brain cells and mouse models found that ponesimod, an MS drug, could potentially be repurposed to treat AD by reducing amyloid plaques and improving cognition. In conclusion, the relationship between MS and AD is complex, involving both protective and risk-enhancing factors. Further research is needed to elucidate the underlying mechanisms and potential therapeutic implications of this association.

Keywords : Multiple sclerosis; Alzheimer's disease; amyloid pathology

Count: 214
Abstract ID: 468
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Investigating the neuroprotective effect of isorhamnetin in the 6-hydroxydopamine model of male Wistar rat

Submission Author: Hootan Shahdoost

Hootan Shahdoost[1], Shahram Darabi [2]

1. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran
2. Cellular and Molecular Research Center, Research Institute for Prevention Non-communicable Diseases Qazvin University of Medical Sciences, Qazvin, Iran.

Background and Aim : isorhamnetin is a chemical compound extracted from the Hippophae rhamnoides. large body of evidence supports a role of oxidative stress as a major factor of cell death in Parkinson's disease (PD). Natural antioxidant agents can enhance the immunological ability leading to healthier though they usually have several mixture. For PD, natural antioxidant polyphenol agents are good candidate for treatment, because the pathogenesis of PD is complex with many pathways. These effects are more evidence when the clinic trial is for long term treatment. This study focused on the protecting effects of natural antioxidants on neurons in PD and functional improvement, especially summarized the results about protective effect of isirhamnetin on neurons against cell death of animal PD models.

Methods : Therefore, this study examined whether isorhamnetin administration would attenuate behavioral and histological deformities in an experimental model of PD in rat. For this purpose, unilateral intrastriatal 6-hydroxydopamine (6-OHDA)-lesioned rats were pretreated with a isorhamnebtin 3days before Stereotactic surgery and post treated 4weeks after Stereotactic surgery . Apomorphine-induced rotations and the number of Nissl-stained neurons in the substantia nigra pars compacta (SNC) were counted after 4 weeks.

Results : isorhamnetin administration could attenuate the number of rotations to the opposite side of the lesion in the treatment group compared to the lesion and prevent the destruction of substantia nigra neurons in the pars compacta.

Conclusion : : isorhamnetin administration has a protective effect against 6-OHDA toxicity

Keywords : Parkinson disease, isorhamnetin

Count: 215
Abstract ID: 534
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Expression of clock genes per1, bmal1 and cry1 in suprachiasmatic nucleus and pineal gland of ovariectomized rats in scopolamine-induced Alzheimer's model

Submission Author: Reshad Rezapour

Reshad Rezapour[1], Afsaneh Jaberi-Asl[2], Mina Eftekharzadeh[3], Mona Farhadi[4], Seyed Behnam Jameie[5]

1. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
4. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran
5. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) leads to circadian rhythm and sleep dysfunction. Suprachiasmatic nucleus (SCN) is known for regulating circadian rhythm via clock genes. Female sex steroid deprivation such as menopause causes dramatic changes in the sleep-wake cycle in AD patients. This study was designed, to determine the possible role of the SCN and pineal gland clock genes, bmal1, per1 and cry1, in AD and female sex steroid deprivation model.

Methods : Adult female rats were used including: control, Ovariectomized (OVX), AD and AD+OVX. To induce AD, scopolamine was used and OVX was done routinely. To confirm AD, congored staining was done in hippocampus. In order to show the expression of per1, bmal1, cry1 and p53 genes the qRT-PCR was used.

Results : The expression of above genes in SCN was significantly decreased in trial groups in contrast to p53 that was significantly increased. For the pineal gland, we did not find any significant results.

Conclusion : Accordingly, it is concluded that the any changes in the expression of the clock gens of SCN and pineal gland could be supposed as possible mechanisms in sleep disorders of menopaused AD patients.

Keywords : per1, bmal1, cry1, SCN, pineal gland, ovariectomy, Alzheimer's disease

Count: 216
Abstract ID: 715
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Evaluation of therapeutic effects of Prostaglandin E1 in a rat model of Alzheimer's disease via nasal route: focusing on neutrophils and brain glymphatics

Submission Author: Nafiseh Pakravan

Nafiseh Pakravan[1], Houra Haji Molla Asadolah[2], Simin Mahakizadeh[3], Ardeshir Abbasi[4]

1. Division of Immunology, Medical School, Alborz University of Medical Sciences, Karaj, Iran
2. Student Research Committee, Medical School, Alborz University of Medical Sciences, Karaj, Iran
3. Department of Anatomy, Medical School, Alborz University of Medical Sciences, Karaj, Iran
4. Department of Immunology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is a neurological disease with an upward growth of more than 145%, which leads to a great psychological and economic burden. Although many researches have focused on the treatment of the disease for decades, there is no effective treatment to fight the devastating neurodegeneration in AD patients. Neutrophils play pivotal role in the chronic neuroinflammatory process ongoing in the brain of AD. Some studies have suggested that suppression of inflammation and others indicated neutrophil depletion helps AD improvement. However, despite many effort attempting immunosuppression have not succeeded promising results to treat AD. The role of inflammation and neutrophils in the AD pathogenesis and anti-inflammatory role of prostaglandin E1 (PGE1) with the inhibitory effects on neutrophils prompted us to challenge the immunosuppression strategy for treatment of AD and investigate the effects of PGE1 on nasal tissue and brain tissues in Alzheimer's animal model. The nasal tissue was evaluated based on the bi-directional nasal-brain axis.

Methods : To achieve the goals, a rat model of AD was established by intra-hippocampal injection of β-amyloid into the bilateral hippocampus of the brain. After one week, nasal administration of PGE1 was performed, Morris maze test was performed to compare the cognitive performance of both control and treatment groups. The animals were euthanized three days after last treatment. The nasal and brain tissues were isolated and immunohistochemical evaluation of interleukin-(IL-)17, matrixmetalloproteinase-(MMP-)9, myeloperoxidase (MPO), reactive oxygen species (ROS), and prospero-related homeobox-1 (Prox-1) markers were performed.

Results : Our results revealed that nasal administration of PGE1 did not affect learning memory as well as beta-amyloid plaques level in the brain tissue. MPO and PROX-1 levels were increased in the perivascular lymphatic vessel along superior sagittal sinus. Notably, the organization of vascular architecture were better organized comparing with the control group. In the nasal tissue, MPO, MMP-9, and IL-17 levels were increased comparing with the control

group. However, ROS level were decreased in the nasal tissue of PGE1-treated animals compared to the control group in the corresponding tissue.

Conclusion : Results of this study suggest that neuro-inflammationin AD is a complicated process and immunosuppression may not be a good approach to treat/control the disease. Despite anti-inflammatory properties of PGE-1, it did not deviate neutrophils toward appropriate activation. On this basis, combined treatments are suggested along with a better understanding of the neuro-inflammation in AD. New understanding of neuro-inflammation may even open novel pavement regarding other chronic inflammatory disease.

Keywords : Alzheimer's disease, prostaglandin E1, neutrophil, brain, glymphatics

Count: 217
Abstract ID: 370
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Differential gene expression investigation in multiple regions of the brain of Parkinson's disorder patients

Submission Author: Fatemeh Akhondsolaei

Fatemeh Akhondsolaei[1], Dina Morshedi [2], : Najaf Allahyari Fard[3]

1. Department of Bioprocess Engineering, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
2. Department of Bioprocess Engineering, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
3. Department of Systems Biotechnology, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran

Background and Aim : The second serious neurodegenerative disease, Parkinson's disease (PD), is represented by bradykinesia, rigidity, and postural instability. The cellular degradation process of (PD) remains unknown, considering the recent rapid development of data on its DNA-related elements. Gathering information about each part of the brain and constructing an accurate holistic model for analysis are crucial steps towards improving knowledge about the mechanisms behind PD progress. The gene network is formed up of numerous molecules that link together within the cell. Various in silico programs are utilized to simulate and remodel these networks with the goal to improve understanding of the disease mechanism and provide more beneficial suggestions for drug targets and treatments.

Methods : GEO datasets including GSE8397,20291,20292,20168,7621 And GEOtoR were used for analysis, prediction of overexpressed, and under expressed genes. For the purpose to investigate the connections among highly genetic proteins and how they interact in healthy conditions, STRING 11 was used for protein-protein interaction network. Cytoscape was used for build and analyze networks to find hub genes. Enrichr was used for genes enrichment analysis, also KEGG and Reactome were used to find hub genes, procedures, and pathways. Using the STRING database as a guide, we built a PPI network featuring target genes. We presented each protein as a node and illustrated connections between nodes via lines. The number of lines connecting a given node to another was defined as the connection degree.

Results : Our results indicated among the hub genes, the most prominent ones were TH, SLC18A2, DDC, SLC6A3 In highly expressed genes.Also SLC13A1, GCM1 and NPTX2 are highly underexpressed in substantialnigra. We also found out highly expressed and highly underexpressed in other areas in putamen, cortex and frontal gyrus. . Each region has its own genes differentially expressed and with studying likages between thses genes in future stpes we may find new point of view to how parkinsonism brain would react to disease.

Conclusion : Comparative gene-expression study of cells with various biological types is one of the main uses of gene-array behavior technologies.In the end, these investigations will

produce a thorough knowledge of the molecular mechanisms of many different complex diseases. Gene-array analysis, as compared to single-gene or single-protein investigations, provides an overall picture of changes in gene expression in abnormal states. Given that these genes' changes in expression were discovered to be statistically significant, one could be led to assume that these genes play a major part in PD.

Keywords : PD, Gene expression, Gene Function, Brain segments

Count: 218
Abstract ID: 694
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Protective effect of melatonin against methamphetamine-induced attention deficits through miR-181/SIRT1 axis

Submission Author: Mitra AnsariDezfouli

Mitra AnsariDezfouli[1]

1. Department of Neurology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background and Aim : Methamphetamine (METH) is an addictive psychostimulant with deleterious effects on the central nervous system. Chronic use of METH in high doses impairs cognition, attention and executive functions, but the underlying mechanisms are still unclear. Sirtuin 1 (SIRT1) is a post-translational regulator that is downregulated following METH neurotoxicity. Melatonin is a neuroprotective hormone that enhances mitochondrial metabolism. Here, we evaluated the effect of melatonin on METH-induced attention deficits disorder and the involvement of the miR-181/SIRT1 axis in melatonin neuroprotection.

Methods : METH at a dose of 5 mg/kg was injected for 21 consecutive days. The animals were assigned to receive either melatonin or the vehicle after METH injections. Attention levels were evaluated with abject based attention test. In the prefrontal cortex, the expression levels of miR-181, SIRT1, p53 and CCAR2, as well as the mtDNA copy numbers were evaluated using qRT-PCR and western blotting. The outcomes revealed that melatonin treatment following METH injections improved METH-induced attention deficits.

Results : METH toxicity is associated with changes in the miR-181/SIRT1 axis and elevated levels of p53 and CCOX2 and decreased levels of mtDNA in the prefrontal cortex of adult rats. Interestingly, administration of melatonin improved the expression of these molecules and reduced the toxic effects of METH.

Conclusion : Melatonin ameliorated the neurotoxicity of METH in the prefrontal cortex and the miR-181/SIRT1 axis is involved in the protective effects of melatonin. However, melatonin can be potentially administrated to improve attention impairment in METH use disorders.

Keywords : Methamphetamine, Melatonin,SIRT1, Attention,

Count: 219
Abstract ID: 380
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Antioxidant activity of Nostoc Common against 6-hydroxy dopamine toxicity in the rat striatum

Submission Author: Fatemeh Zeinihamzekolaei

Fatemeh Zeinihamzekolaei[1], Akbar Hajizadeh Moghaddam [2], Ghazaleh Javaherdoust [3], Sedigheh khanjani Jelodar [4], Ehsan Nazifi [5]

1. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
2. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
3. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
4. Department of Animal Sciences, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
5. Department of Plant Sciences, Faculty of Sciences, University of Mazandaran, Babolsar

Background and Aim : Parkinson's is a progressive neurological disorder characterized by the abnormal loss of dopaminergic neurons. Oxidative stress is known as one of the main causes of the pathogenesis of this disease. As a cyanobacterium, Nostoc Common (NC) is rich in antioxidant activities that can protect the body against oxidative damage. This study evaluated the neuroprotective effects of Nostoc common extract on the activity of catalase and superoxide dismutase antioxidant enzymes in the striatum of a hemiParkinson's rat model.

Methods : In this study, rats were divided into four groups: control, 6-OHDA, and 6-OHDA treated with NC (50 and 100 mg/kg, p.o.). The 6-OHDA was injected into the right striata (AP: 1 mm; L: +2.5 mm; D: +4.5 mm) and NC treatments started 24 h later for 21 days. In the end, the activities of catalase (CAT) and superoxide dismutase (SOD) enzymes were measured in the striatum. All data were expressed as mean ± SD. Statistics comparisons between groups were initially assessed using one-way analysis of variance (ANOVA), followed by Tukey's test ($p < 0.05$).

Results : Our results showed that the injection of 6-OHDA into the striatum decreases the activity of CAT ($p<0.01$) and SOD ($p<0.001$) in the striatum, while the treatment with doses of 50 and 100 mg/kg of NC ($p<0.05$) significantly reversed the activity of enzymes.

Conclusion : Therefore, our study showed that the treatment of NC by increasing antioxidant activity can reduce the negative effects of Parkinson's disease by inhibiting oxidative stress.

Keywords : Catalase, superoxide dismutase, Oxidative stress, 6-hydroxy-dopamine, Nostoc Common

Count: 220
Abstract ID: 729
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Calcitriol reduces brain injury by inhibiting NLRP3 inflammasomes in the rat model of cerebral ischemia-reperfusion

Submission Author: Marjan Behdarvandy

Marjan Behdarvandy[1], Seyed Hassan Eftekhar-vaghefi[2], Zeinab Vahidinia[3], Ali Shams Ara[4], Fahimeh Pourjafari[5], Fatemeh Sheikhbahaei[6]

1. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
2. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
3. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
4. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
5. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
6. Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Ischemic Stroke is the second cause of death worldwide and is predicted to increase from 5.7 to 7.8 million in 2030 according to the annual reports of deaths due to stroke. Currently, tissue plasminogen activator is the only effective strategy for stroke treatment. Calcitriol (active vitamin D3) is known as an anti-inflammatory agent against cerebral ischemia and brain trauma. The present study aimed to examine the effects of calcitriol on the expression of NLRP3 inflammasome in the rat model of cerebral ischemia-reperfusion .

Methods : The experimental ischemia/reperfusion (I/R) model was induced in male Wistar rats for one hour, . Calcitriol was given via intraperitoneal injection for three days after the stroke.Seventy-two hours after inducing ischemia, neurobehavioral deficits and infarction volume were assessed. The expression of NLRP3 inflammasome was assayed by western blot.

Results : Our data demonstrated that calcitriol could decrease infarction volume and Improved neurological deficits in brain I/R significantly. Also, calcitriol the expression of NLRP3 inflammasome was decreased significantly.

Conclusion : In conclusion, calcitriol could modulate the inflammation by down-regulating the expression of NLRP3 inflammasome in ischemic brain.

Keywords : Ischemic stroke; NLRP3 Inflammsome; Calcitriol

Count: 221
Abstract ID: 718
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Evaluating the effect of human olfactory mucousmembrane derived,neural stem cell ,administration on stress–induced male rat model of depression

Submission Author: Fatemeh Naghizadeh

Fatemeh Naghizadeh[1], Dr Soraya mehrabi [2], Dr Rafieh alizadeh [3], Dr arezoo nahavandi [4], Mina Goodarzi [5], Ali dadseresht [6]

1. Iran university of medical science
2. Iran university of medical science
3. Iran university of medical science

Background and Aim : Mental depression is one of the five most prevalent chronic diseases in the world with an increasing prevalence.It is now that first reason for absence from work place worldwide. This condition is treatment-resistant in at least 30% of cases, and in the 70% treatable cases,administration none of 23 most prescribed anti-depressant medication, has shown complete treatment and cure, but just modest improvement of sign and symptoms (based on a meta- analysis,printed in 2023).It seems that even in treatable known cases of major depression, there is lack of complete disease regression and treatment.Regenerative medicine platform uses especific stem cells and their derivatives ,such as exosome and/or growth factors to reverse and replace pathologic condition to physiologic situation.Meanwhile, as neurogenesis is active in subventricular layers of lateral ventricles and hippocampus normally, sourced by olfactory bulb(OB) and olfactory membrane (OM) physiologically ,therefore we suggested as mental depression is a neurodegenerative process ,OM (especially as simply available) could be possibly a suitable candidate for treatment of major depressive disorder
Methods : In this study, OM-NSC human olfactory mucus areas used to produce OM-NSC. OM-NSC were administered once and twice respectively. To make depression model, the 6 W chronic unpredictable mild stress, which is the closest one to human major depression was carried out. OM-NSC, were characterized by flowcytometry technique, and then after, were sprayed through nasal canal.One month following administration of OM-NSC the samples were obtained for molecular, histopathologic, biochemical and behavioral evaluation.
Results : Evaluation of all findings, in OM-NSC groups, showed signs of repair and/or replacement of depression induced disorder. These findings confirmed the regenerative activity of mentioned Cells
Conclusion : This study showed for the first time that OM-NSC administration in rat model of major depression was curable which is probably based on their regenerative function. On the other hand, the feasible and non-invasive route of administration could be introduced as a novel technique in major depression treatment, instead of improvement only
Keywords : Depression, neuroscience, neural stem cell

Count: 222
Abstract ID: 625
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Conditioned Medium from Mesenchymal Stem Cells alleviates Depressive-Like Behavior and Neuronal Damage in The Prefrontal Cortex of Streptozotocin-induced Diabetic Rats

Submission Author: Mohammad Hassan Sakhaie

Mohammad Hassan Sakhaie[1], Soheila Madadi[2], Shima Masoudi Minab[3]

1. Department of Anatomy, School of Medicine, Arak University of Medical Sciences, Arak, Iran
2. Department of Anatomy, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran
3. Department of Anatomy, School of Medicine, Arak University of Medical Sciences, Arak, Iran

Background and Aim : Diabetes mellitus (DM) leads to the damage of prefrontal cortex neurons and causes behavioral disorders. It has been suggested that mesenchymal stem cells (MSCs) and their conditioned media (CM) can ameliorate the complications caused by diabetes. This study aimed to investigate the effect of CM derived from MSCs in the prefrontal cortex of streptozotocin-induced type 2 diabetic rats.

Methods : Male Wistar rats (8 wk, 200-250 gr), were randomly divided into four groups: control, diabetes, diabetes+CM of MSCs and diabetes+Dulbecco's Modified Eagle Medium (DMEM). For type 2 diabetes mellitus induction, rats received a single intraperitoneal (IP) injection of streptozotocin (STZ) (65 mg/kg) and nicotinamide (120 mg/kg). One week after, the CM or DMEM (250 µl) was injected intravenously (IV) to group 3 and 4. The anxiety-like behaviors were examined by elevated plus maze test, 2 weeks after the last CM injection. Also, the number of degenerated neurons in the prefrontal cortex was assessed through Cresyl violet staining and pyknotic neurons were counted. Eventually, data was analyzed by SPSS software and ANOVA test.

Results : The current study displayed that the induction of diabetes in rats increased the number of pyknotic neurons ($p < 0.0001$) in diabetic rats. Whereas the injection of CM reduced the number of pyknotic neurons ($p < 0.001$). Also, the CM administration decreases anxiety-like behavior in rats ($p < 0.001$).

Conclusion : These findings suggest that conditioned medium produced from mesenchymal stem cells may be valuable for therapeutic approaches in diabetes disease and diminish its negative effects.

Keywords : Conditioned medium (CM), Mesenchymal stem cells (MSCs), Streptozotocin (STZ), Prefrontal cortex (PC)

Count: 223
Abstract ID: 551
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Assessment of Azithromycin's Influence on Behavioral Function in an Experimental Sciatic Nerve Injury Model

Submission Author: Mohammad Ebrahim Abbaszadeh Kahnamooyi

Mohammad Ebrahim Abbaszadeh Kahnamooyi[1], Bagher Pourheydar[2], Gholamhossein Farjah[3]

1. Department of Anatomical Sciences, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.
2. Department of Anatomical Sciences, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.
3. Department of Anatomical Sciences, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran.

Background and Aim : Peripheral nerve injuries are a major medical issue, often leading to significant motor and sensory dysfunction that can severely impact a patient's quality of life. Beyond the initial mechanical damage, inflammatory processes, particularly the activation of pro-inflammatory macrophages (M1), exacerbate nerve degeneration. Effective management of inflammation is crucial to promoting nerve recovery and improving functional outcomes, such as sensory and motor function. Azithromycin, an antibiotic with notable anti-inflammatory effects, has shown potential in modulating the immune response by inhibiting M1 macrophages and stimulating anti-inflammatory M2 macrophages. Through this dual action, azithromycin may reduce inflammation and support nerve repair. In the context of sciatic nerve injury, improving behavioral outcomes—specifically motor and sensory recovery—remains a primary therapeutic goal. By attenuating the inflammatory response and enhancing nerve regeneration, azithromycin may present a promising approach to improving the recovery of sciatic nerve function in experimental models. Therefore, the aim of this study was to investigate the effects of azithromycin on the improvement of behavioral function of the sciatic nerve in a rat model of sciatic nerve injury.

Methods : Twenty-one adult male rats were randomly assigned to three groups: Control, Lesion, and Azithromycin (AZ). A surgical sciatic nerve crush injury was performed on all groups except the Control group. Azithromycin was administered for a duration of seven days post-injury. The sciatic function index (SFI) test was conducted to assess functional recovery on days 14, 28, and 42 after the surgery. To evaluate sensory recovery, the Hot Plate and paw withdrawal tests were performed on day 42 post-surgery. Data were analyzed statistically to compare the efficacy of azithromycin in facilitating nerve recovery.

Results : In the SFI test, the azithromycin group demonstrated a significantly higher SFI score on days 14, 28, and 42 compared to the lesion group, although it remained significantly lower than the control group. In the Hot Plate test, which evaluates thermal hyperalgesia, azithromycin effectively improved thermal pain sensitivity, showing a significantly longer

withdrawal time compared to the lesion group, though still lower than the control group. However, in the paw withdrawal test, azithromycin failed to produce a significant improvement in mechanical hyperalgesia, with no significant increase in the pain threshold compared to the lesion group, and it remained significantly lower than the control group.

Conclusion : Azithromycin showed promising effects in improving both functional recovery and thermal hyperalgesia in a sciatic nerve injury model, as seen in the SFI and Hot Plate tests. However, it did not significantly affect mechanical hyperalgesia in the paw withdrawal test. Further research is needed to better understand azithromycin's potential in enhancing motor function recovery of the sciatic nerve.

Keywords : Azithromycin, Sciatic nerve injury, Behavioral function

Count: 224
Abstract ID: 565
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

The Role of Oxidative Stress in Neural Cell Death: Implications for Therapeutic Strategies

Submission Author: Morteza Abdi

Morteza Abdi[1]

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

Conclusion : Oxidative stress is a major contributor to neural cell death in neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis (ALS). This review explores the mechanisms by which oxidative stress drives neuronal loss and discusses potential therapeutic strategies aimed at mitigating its harmful effects. Oxidative stress occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the body's ability to detoxify them through antioxidant defenses. Neurons, due to their high metabolic activity and limited capacity for regeneration, are particularly vulnerable to ROS-induced damage. Mitochondria, the primary source of ROS, play a crucial role in this process. Mitochondrial dysfunction not only increases ROS production but also exacerbates oxidative damage to cellular components, such as lipids, proteins, and DNA. This damage disrupts cellular integrity and activates apoptotic and necrotic pathways, leading to progressive neuronal death and contributing to the progression of neurodegenerative diseases. The body's natural antioxidant systems, including enzymes like superoxide dismutase (SOD) and glutathione peroxidase (GPx), are designed to neutralize ROS and protect cells from oxidative damage. However, in the context of neurodegenerative diseases, these systems are often overwhelmed, allowing oxidative stress to accumulate and promote neural cell death. Given the central role of oxidative stress in neural degeneration, therapeutic approaches targeting this process have gained attention. Antioxidants, such as vitamin E, coenzyme Q10, and N-acetylcysteine (NAC), have been investigated for their potential to reduce ROS levels and protect neurons. Additionally, emerging therapies aimed at preserving mitochondrial function are showing promise in reducing oxidative stress. Advances in nanotechnology have further opened new avenues for targeted antioxidant delivery. Nanoparticle-based systems capable of crossing the blood-brain barrier are being developed to enhance the precision of antioxidant treatments, offering more effective protection against neural cell death. In conclusion, oxidative stress is a key factor in neural cell death and neurodegenerative disease progression. Therapeutic strategies targeting oxidative damage, including antioxidants and mitochondrial protection, hold promise for slowing or preventing neuronal loss and improving patient outcomes.

Keywords : Oxidative Stress, Neural Cell Death, Neurodegenerative Diseases, Antioxidant Therapy

Count: 225
Abstract ID: 552
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Poster

Assessing Autonomic Nervous System Dysfunction in Parkinson's Disease: Exploring its Correlation with Disease Severity

Submission Author: Fatemeh Rabiei

Fatemeh Rabiei[1], Payam Saadat[2], Hoda Shirafkan[3]

1. Student Research Committee, Babol University of Medical Sciences, Babol 47176-47745, Iran.
2. Mobility Impairment Research Centre, Health Research Institute Clinical Research Development Unit of Rouhani Hospital, Babol University of Medical Sciences, Babol, Iran.
3. Social Determinants of Health Research c=Center, Health Research Institute, Babol University of Medical Sciences, Ganjafrooz Street, Babol, Iran.

Background and Aim : Autonomic dysfunction is a common complication in Parkinson's disease (PD), manifesting as cardiovascular, gastrointestinal, thermoregulatory, pupillomotor, sexual, and urinary disorders. These dysfunctions significantly affect the quality of life and clinical management of PD. This study aims to examine the prevalence of autonomic dysfunction in PD and its association with disease severity.

Methods : This cross-sectional study included 130 PD patients and 130 age- and sex-matched healthy controls. Autonomic dysfunction was assessed using the SCOPA-AUT (Scales for Outcomes in Parkinson's Disease–Autonomic Dysfunction) questionnaire. Statistical analysis was performed using SPSS version 24, with a significance level set at $p<0.05$.

Results : The mean age of the PD group was 67.45 ± 9.04 years. Autonomic dysfunction was present in 77.7% of PD patients. The most prevalent disorders were gastrointestinal (86.9%), urinary (84.6%), cardiovascular (60.8%), thermoregulatory (51.5%), pupillomotor (30%), and sexual dysfunction (50.8%). In all autonomic subscales, PD patients exhibited significantly higher dysfunction compared to controls ($p<0.05$). Additionally, there was a positive correlation between disease stage and the severity of autonomic dysfunction in both gastrointestinal and urinary systems ($p<0.05$).

Conclusion : Autonomic dysfunction in PD patients is more prevalent than previously reported, with gastrointestinal, urinary, cardiovascular, and thermoregulatory issues being the most common. Constipation, frequent urination, postural hypotension, and excessive sweating were identified as key symptoms. Importantly, as PD progresses, the severity of autonomic dysfunction increases, particularly in the digestive and urinary systems. These findings underscore the need for early identification and targeted management of autonomic symptoms in PD.

Keywords : Parkinson's disease; Autonomic dysfunction; Disease severity; Gastrointestinal disorders; Urinary disorders

Count: 226
Abstract ID: 678
subject: Neural Injuries and Neurodegenerative Disorders: Neurodegenerative Disorders
Presentation Type: Oral

Chemokine-Mediated Neuroinflammation in Alzheimer's Disease: Effects of Doxycycline and LPS on Immune Response and Biomarker Identification

Submission Author: Anahita Esmaeili Mehr

Anahita Esmaeili Mehr[1], S.A. Shahzadeh Fazeli[2], A. Amiri-Yekta[3], Y. Tahamatni [4]

1. Department of Molecular Cell Biology-Genetics, Faculty of Basic Sciences and Advanced Technologies in Biology, University of Science and Culture, Tehran, Iran
2. Department of Genetics, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran
3. Department of Genetics, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran
4. Department of Stem Cells and Developmental Biology, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR, Tehran, Iran.

Background and Aim : Alzheimer's disease (AD) is a neurodegenerative disorder characterized by accumulation of amyloid-β (Aβ) plaques and tau tangles, leading to cognitive decline (1). AD is influenced by factors such as age, genetics, and environmental conditions. (2) This study explores the effects of doxycycline (DOX), used as a transgene control agent in neurodegenerative models, on gut microbiome diversity and immune responses, particularly under systemic inflammatory conditions like lipopolysaccharide (LPS) exposure. DOX reduced microbiome diversity in both transgenic and wild-type mice, raising concerns about its influence on inflammation. Additionally, key hub genes involved in immune processes were identified, providing insights into the combined effects of DOX and LPS. (3)

Methods : The study aims to identify differentially expressed genes (DEGs) contributing to AD development. Raw microarray data from GSE236242, consisting of 23 paired expression datasets from the brain cortex of treated (DOX and LPS) and untreated wild-type (WT) mice, were obtained from the GEO database. DEGs across five groups were analyzed using GEO2R, applying thresholds of adj.p.value ≤ 0.05 and varying logFC, specifically logFC ≥ 2 for LPS vs Untreated, logFC ≥ 0.7 for LPS+DOX vs LPS, logFC ≥ 3 for LPS+DOX vs DOX, logFC ≥ 3 for LPS+DOX vs Untreated, and logFC ≥ 0.5 for DOX vs Untreated. The mouse genes were mapped to human orthologs using the STRING database to construct a protein-protein interaction (PPI) network, further analyzed with Cytoscape.

Results : Comparison between DOX vs Untreated showed no significant gene expression changes, indicating that DOX alone does not induce notable inflammatory gene expression (3). The study consistently identifies CXCL10, CCL2, and CCL5 as central genes across multiple comparisons, implicating them as key mediators of the neuroinflammatory response triggered by LPS and modulated by DOX. CXCL10, CCL2 (MCP-1), and CCL5 (RANTES) are chemokines that play critical roles in AD by mediating neuroinflammatory processes. Elevated

expression of these chemokines is linked to AD progression. CXCL10, expressed in astrocytes, is upregulated around Aβ plaques, contributing to neuroinflammation and cognitive decline, positioning it as a potential biomarker for AD. Similarly, CCL2, produced by Aβ-stimulated microglia and astrocytes, is associated with cognitive deterioration and blood-brain barrier disruption. CCL5, involved in neuronal plasticity and synaptic integrity, has both neuroinflammatory and neuroprotective roles. Increased expression of these chemokines in the blood may serve as useful biomarkers for early diagnosis and tracking of AD progression, and as targets for therapeutic interventions (3-7).

Conclusion : In conclusion, this study highlights the roles of CXCL10, CCL2, and CCL5 in AD-related neuroinflammation. While DOX alone does not trigger significant inflammatory gene expression, its combination with LPS reveals important immune activation pathways. These chemokines demonstrate potential as biomarkers for AD progression. CXCL10's association with Aβ plaques, CCL2's involvement in microglial activation and blood-brain barrier disruption, and CCL5's dual roles in neuroprotection and inflammation underscore their relevance to AD pathology. These findings suggest that increased chemokine expression in peripheral blood could serve as early diagnostic markers and therapeutic targets for Alzheimer's disease. Future research should focus on developing biomarker-driven tools for AD diagnosis and treatment, especially targeting neuroinflammatory processes to slow disease progression.

Keywords : Alzheimer's disease, Neuroinflammation, Doxycycline, Biomarker

Count: 227
Abstract ID: 543
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Application of Artificial Intelligence in the Diagnosis and Treatment of Alzheimer's Disease

Submission Author: Romina Cheraghi

Romina Cheraghi[1], Saha Shahbazi[2]

1. Farzanegan High School, National Organization for Development of Exceptional Talents (NODET), Karaj, Iran
2. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

Conclusion : Alzheimer's Disease (AD), a progressive neurodegenerative disorder, is a major global healthcare issue affecting millions of people worldwide. Despite significant advancements in medical science, the early diagnosis and effective treatment of AD continue to pose critical challenges. Artificial intelligence (AI), particularly machine learning (ML) and deep learning (DL), has shown significant promise in addressing these challenges. This review summarizes existing research on AI applications in AD management, emphasizing diagnostic and therapeutic aspects. Recent studies indicate that AI has the potential to improve the early detection of AD by analyzing complex neuroimaging data, such as MRI and PET scans, as well as cerebrospinal fluid biomarkers, such as β-amyloid plaques and tau protein accumulations in PET scans, and genetic information, like APOE genotyping. These AI-powered approaches, notably convolutional neural networks (CNNs), may detect small changes in brain structures related to hippocampal volumes and cortical thickness using MRI data. In addition to diagnostic advances, AI has aided drug discovery by analyzing large datasets to uncover possible therapeutic compounds. This has accelerated the identification of disease-modifying treatments that target the pathological mechanisms of AD. Moreover, AI-based cognitive training programs are being developed to personalize treatment strategies for individuals at different stages of cognitive decline, showing promise in slowing disease progression. Clinical applications of AI in AD have already demonstrated impressive results. While integrating AI into clinical practice has the potential to revolutionize AD diagnosis and treatment, there are still challenges that must be overcome. These include the need for larger, more diverse datasets to improve the generalizability of AI models, as well as concerns related to patient data privacy. As AI evolves, future research should focus on refining these tools to create more personalized and effective treatment options for AD.

Keywords : Artificial Intelligence; Alzheimer's Disease; Deep Learning; Neuroimaging; Drug Discovery; Personalized Medicine

Count: 228
Abstract ID: 366
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Development and biological evaluation of novel Indanone-Chalcone Hybrids through Molecular hybridization as anti-Alzheimer agents

Submission Author: Golnoush Rahvar

Golnoush Rahvar[1], Fereshteh Azimian[2], Narges Cheshmazar[3], Mohammad Shahrivar-Gargari[4], Teymour Vahedpour[5], Mahrokh Dastmalchi[6], Siavash Dastmalchi[7]

1. 1Department of Medicinal Chemistry, School of Pharmacy, Tabriz University of Medical Sciences, Tabriz,Iran
2. Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
4. Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
5. Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
6. Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
7. Department of Medicinal Chemistry, School of Pharmacy, Tabriz University of Medical Sciences, Tabriz,Iran; Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran;

Background and Aim : Alzheimer's disease (AD) is a neurological condition marked by cognitive impairment and memory loss. While the precise mechanisms underlying the onset and progression of AD remain unclear, several physiological factors such as acetylcholine depletion, oxidative stress, inflammation, and the accumulation of β-amyloid (Aβ) plaques have been identified as contributing elements. Despite the presence of various anti-Alzheimer medications in the market, there remains a pressing need for the development of more effective drugs with fewer side effects. Acetylcholinesterase (AChE) inhibitors play a crucial role in enhancing central cholinergic function by obstructing the enzymes responsible for degrading acetylcholine (ACh), thus increasing ACh availability to activate nicotinic and muscarinic receptors in the brain. Additionally, AChE promotes the aggregation of the Aβ1–40 peptide, facilitating amyloid formation. The strategy of molecular hybridization has emerged as a significant advancement in medicinal chemistry. This method involves integrating key pharmacophoric elements from various bioactive compounds to develop new hybrid entities with enhanced efficacy. . In this study, using the molecular hybridization strategy and bio isosteric substitution, a novel series of compounds are designed, synthesized, and biologically evaluated for their anti-Alzheimer's effect.

Methods : Using the structure of donepezil alongside molecular hybridization and bioisosteric replacement strategies, a series of innovative hybrid compounds were developed as potential anti-Alzheimer agents. The derivatives featuring an indanone-chalcone core were created by substituting the ester group for the carbamate scaffold of donepezil. The designed compounds were synthesized, and their structures were characterized through IR and NMR spectroscopy. The synthesized compounds were subsequently evaluated for their potency in inhibiting AChE activity and Aβ1–40 aggregation. Additionally, a molecular docking study was conducted to

assess the interactions of the designed compounds with the AChE enzyme. Finally, the most potent compound was evaluated for its physico-chemical and drug likeness properties.

Results : 14 novel compounds featuring an indanone-chalcone structure were designed using molecular hybridization techniques. These compounds were assessed for their ability to inhibit AChE and Aβ1–40 aggregation. The findings indicated that one compound (8e) displayed significant anticholinesterase activity, with an IC50 value of 18.7 µM against AChE, compared to the reference drug donepezil, which had an IC50 of 0.036 µM on AChE . Additionally, among the synthesized compounds, compound 8h showed the highest inhibition of Aβ1–40 aggregation at 81.6%. Docking studies suggested that the most effective compound exhibited similar interactions with AChE as donepezil.

Conclusion : In summary, this study successfully synthesized a range of indanone-chalcone derivatives containing an ester group, aimed at inhibiting AChE in Alzheimer's disease. The results demonstrated that many of these compounds were capable of inhibiting AChE activity. Overall, the findings indicate that indanone-chalcone compounds with ester functional groups could offer new insights into the design and synthesis of anti-Alzheimer's medications.

Keywords : Molecular hybridization, donepezil, amyloid beta-protein aggregation, indanone-chalcone hybrid, docking, cholinesterase inhibitor

Count: 229
Abstract ID: 670
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

A Review of Auditory Processing Disorders in Dementia

Submission Author: Mohaddese Vahabi

Mohaddese Vahabi[1]

1. Student Research Committee, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Conclusion : Dementia is a relatively common neurological disorder, affecting approximately 50 million people worldwide, with nearly 10 million new cases each year. It primarily impacts older adults and is characterized by a decline in cognitive functions such as memory, thinking, and reasoning. Among the various symptoms of dementia, auditory processing disorder is increasingly recognized as a significant issue. Neurophysiological mechanisms underlying this disorder in dementia may include degeneration in the auditory cortex, disrupted neural pathways in the brainstem, and reduced synaptic efficiency in the central auditory nervous system. Additionally, alterations in neural timing and processing speed, common in dementia, can further exacerbate auditory processing difficulties. Given the prevalence of dementia and the importance of evidence-based management of symptoms and issues faced by these patients, it is crucial to achieve a precise understanding of auditory processing disorders in this population. Therefore, this study aimed to explore the auditory processing deficits in this neurodegenerative disease. A comprehensive literature review was conducted, analyzing studies published between 2010 and 2024 in Web of Science, PubMed, Scopus and Google Scholar. Among the reviewed articles, 16 studies met the inclusion criteria according to the PRISMA protocol, and were included in the study. Results revealed that patients with dementia perform significantly worse on auditory processing compared to normal controls. Sustained and selective auditory attention are often compromised in these patients, making it challenging for them to focus on specific sounds or conversations in background noise. Short-term and working memory related to auditory information have also been reported to be impaired in this population, hindering their ability to retain and manipulate auditory stimuli over time. Additionally, many patients with dementia experience difficulties in speech perception, especially in noisy situations, which is attributed to impaired cognitive resources and neural degeneration affecting the auditory cortex and related neural pathways. The patients also show deficits in temporal resolution, leading to difficulties in processing the timing of auditory information. These auditory temporal processing deficits affect their ability to follow rapid speech and detect subtle changes in sound, exacerbating the speech perception difficulties they suffer from. Dichotic listening, which refers to the auditory nervous system's ability to process different sounds presented simultaneously to each ear, is also impaired in patients with dementia, contributing to challenges in understanding speech, especially in complex auditory environments. According to the mentioned results, there are significant discrepancies in auditory processing abilities between patients with dementia and normal controls. Those with dementia perform significantly poorer in different auditory processing tasks, reinforcing the need for detailed auditory processing assessments in this population. Comprehensive

evaluation of auditory processing is crucial for early intervention to address both auditory and cognitive dysfunctions, aiming to enhance communication abilities and overall quality of life.

Keywords : Dementia; Auditory processing disorder; Speech perception in noise; Auditory attention; Auditory memory; Dichotic listening

Count: 230
Abstract ID: 417
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Inhibition of Histone Methyltransferase Promotes Cognition and Mitochondrial Function in Vascular Dementia Model

Submission Author: Behjat Seifi

Behjat Seifi[1]

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

Background and Aim : Vascular dementia (VD) is one of the most common forms of dementia worldwide, characterized by problems with reasoning, planning, judgment, and memory. This study investigated the effect of a histone methyltransferase inhibitor on cognition and mitochondrial function in a rat model of VD, as well as its impact on H2O2-induced neurotoxicity in hippocampal neuronal cultures.

Methods : In the in vivo experiments, VD was induced by bilateral occlusion of the common carotid artery (CCA) for one month. The histone methyltransferase inhibitor, BIX01294, was administered intracerebroventricularly for one month (22.5 µg.kg-1 three times/week). On day 30, behavioral tests, including the novel object recognition test and elevated plus maze test, were conducted. Mitochondrial enzyme activities, including aconitase, α-ketoglutarate dehydrogenase (α-KG), complex I, and complex IV, were evaluated in the hippocampus of rats following CCA ligation. In the in vitro experiments, the effect of BIX01294 (50 to 600 µM) on H2O2 (400 µM)-induced cytotoxicity in hippocampal neuronal cells was assessed using the MTT assay. Flow cytometry was performed to evaluate apoptosis.

Results : Our findings revealed that BIX01294 effectively improved memory function, Krebs cycle enzyme activity, and mitochondrial function in the rat model of VD. Moreover, in vitro results showed that BIX01294 at a concentration of 100 µM significantly reversed the cytotoxicity and apoptosis induced by H2O2 in neuronal cells.

Conclusion : These findings suggest that BIX01294 may have the potential to improve VD complications by reducing oxidative stress and inhibiting histone methylation.

Keywords : Vascular dementia; Mitochondrial function; Histone methyltransferase inhibitor; Oxidative stress

Count: 231
Abstract ID: 284
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Cerebral inhibition of the H3K9 methylation could ameliorate blood-brain barrier dysfunction and neural damage in vascular dementia

Submission Author: Mina Ranjbaran

Mina Ranjbaran[1]

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

Background and Aim : Dementia is a broad category of brain diseases denoting various brain diseases with degenerative or vascular components that cause a long-term and often gradual decrease in the ability to think and remember severe enough to affect daily functioning. Literature has indicated that the G9a/GLP enzyme, through upregulating histone 3 lysine 9 dimethylation (H3K9me2), is a major effector in VD. In such a way that the increase of H3K9 methylation by G9a/GLP during vascular dementia leads to inhibiting the expression of neuroprotective proteins and also reduces the expression of proteins that play a crucial role in the blood brain barrier function. Using a model of permanent common carotid arteries (CCA) occlusion, we investigated the impact of a G9a/GLP inhibitor (BIX01294) on VD.

Methods : After occlusion of the CCA, BIX01294 (22.5µg.kg-1) was given intraperitoneally three times a week for a month. Nissl staining, Evans blue, and brain water content were assessed and western blot analysis was used to evaluate the hippocampal levels of Bax and Bcl2.

Results : Using BIX01294 enhanced blood-brain barrier stability ($P < 0.05$) and subsequently reduced brain edema in comparison to the VD group ($P < 0.05$ for both). Neural injury in the CA1 area of the treatment group decreased by BIX01294 injection when compared to the VD group ($P<0.05$). On the other hand, the Bax/Bcl2 ratio considerably decreased in the treatment group ($P < 0.0001$).

Conclusion : To summarize, our research shows that inhibiting H3K9 methylation can prevent the development of vascular dementia by reducing the level of cerebral edema and neural apoptosis in the hippocampus area after ischemic stroke.

Keywords : H3K9; Brain edema; Blood-brain barrier; Vascular dementia; Cerebral ischemia

Count: 232
Abstract ID: 562
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Time-dependent effects of metformin on hippocampal cell and volume in a rat model of vascular dementia: A stereological study

Submission Author: Zahra Mojarrab

Zahra Mojarrab[1], Masoud Haghani[2], Somayeh Akbari[3], Amirhossein Yousefi Nejad[4]

1. Department of Neuroscience, Faculty of Advanced Medical Sciences and Technologies, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Physiology, the Medical School, Shiraz University of Medical Sciences, Shiraz, Iran
3. Histomorphometry and Stereology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
4. Department of Veterinary Medicine, Faculty of Veterinary Medicine, Islamic Azad University of Kazeroon, Shiraz, Iran

Background and Aim : Vascular dementia (VaD) is a progressive cognitive disorder characterized by a decline in memory and cognitive function due to impaired blood flow to the brain. Recent studies suggest that metformin, beyond glycemic control, can alleviate inflammation and oxidative stress—two pivotal factors in the pathophysiology of vascular dementia— and has turned it into a candidate for therapeutic intervention. This study aimed to evaluate the efficacy of the time-dependent effect of metformin on the number and volume of neurons in the hippocampal CA1 region in the VaD model by two-vessel occlusion (2VO).
Methods : Twenty-five male Sprague-Dawley rats were divided into 5 groups as follows: the control group, sham-operation group (sham), the group that underwent 2VO surgery (2VO +V (vehicle); the 2VO group that received metformin shortly after 2VO (2VO+E-Met), and the 2VO group that received metformin later after 2VO (2VO + L-Met). The animals in the 2VO+E-Met group received metformin (50 mg/kg intraperitoneal; i.p) once a day from day 0–30 after 2VO. In the 2VO+L-Met group, i.p injection of 50 mg/kg metformin started on day 19 and continued until the 30th day. On the day's 30th post-surgery, the brains were removed for stereological study.
Results : Our data indicated that the volume and total number of the pyramidal cells of CA1 significantly decreased in the 2VO+V group compared to the sham group. The late treatment failed to recover these parameters. However, early treatment with metformin increased the number of hippocampal CA1 neurons to levels that were comparable with control and sham groups. Also, early treatment of metformin caused a partial improvement in the volume of hippocampal CA1 neurons in the 2VO+ E-Met rats group, so it did not show any difference with the control group nor with the 2VO group.
Conclusion : Our data showed that neuronal loss was rescued only with early administration. Therefore, it seems that the early injection of metformin is necessary to improve the structural changes in the CA1 region of the hippocampus.
Keywords : vascular dementia; Hippocampus; metformin; stereology

Count: 233
Abstract ID: 698
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Divergent Effects of Different Ions on Amyloid-Beta Aggregation Dynamics in Alzheimer's Disease

Submission Author: Elahe Farhang

Elahe Farhang[1]

1. Department of Biophysics, Faculty of Biological Science, Tarbiat Modares University, Tehran, Iran

Conclusion : Amyloid-beta (Aβ) peptide aggregation, a central feature in Alzheimer's disease (AD) pathology, is highly influenced by the brain's microenvironment, particularly by metal ions such as Zn^{2+}, Cu^{2+}, Ni(II), and Li, which modulate Aβ aggregation, toxicity, and fibril morphology. Recent findings suggest lithium (Li^{+}) may also benefit AD treatment, though its interaction with Aβ peptides and underlying mechanisms remain poorly characterized. This study combines biophysical methods to examine Aβ40 peptide mutants and the multivariate impact of pH, Zn^{2+}, and Li^{+} on Aβ aggregation. Four Aβ40 mutants were generated with selective substitutions in the hydrophobic LVFFA core region, a sequence critical for fibril stability, revealing conserved aggregation pathways with minor kinetic changes. Circular dichroism (CD) and atomic force microscopy (AFM) analyses confirmed fibril formation and β-sheet structures for all mutants. At the same time, Thioflavin T (ThT) fluorescence indicated a slight increase in aggregation rates for specific substitutions influenced by localized structural changes. Further, researchers assessed the effects of Zn^{2+} and Li^{+} ions on Aβ aggregation kinetics and fibril morphology. Zn^{2+} ions significantly accelerated fibrillation at physiological pH, with varying ionic strengths modulating the aggregation pathway, likely through interactions with histidine residues. Conversely, Li^{+} displayed weak, non-specific interactions with Aβ peptides, requiring high concentrations to affect aggregation minimally. Li^{+} ions did not compete effectively with Zn^{2+} or Cu^{2+} ions for binding to Aβ, indicating that Li^{+}'s potential therapeutic effects in AD may occur through alternative biological pathways rather than direct modulation of Aβ aggregation. These findings underscore the selective influences of metal ions on Aβ aggregation, suggesting that Zn^{2+} promotes aggregation via residue-specific interactions while Li^{+} exerts negligible impact. These insights advance our understanding of how the AD brain's ionic environment can selectively drive Aβ aggregation, providing a framework for metal-targeted interventions in AD.

Keywords : Alzheimer's disease, amyloid-beta, aggregation kinetics, fibril morphology, metal ion interactions, biophysical characterization

Count: 234
Abstract ID: 533
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

The effect of resveratrol on the expression of clock gene Per1, bmal1 and in the suprachiasmatic nucleus of scopolamine-induced Alzheimer's rat model

Submission Author: Reshad Rezapour

Reshad Rezapour[1], Afsaneh Jaberi-Asl[2], Ali Vasheghani Farahani[3], Alireza Bahrami Rad[4], Mona Farhadi[5], Seyed Behnam Jameie[6]

1. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran
2. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Department of Cellular and Molecular Biology, Faculty of Advanced Science and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
4. Department of Biology, Central Tehran Branch, Islamic Azad University, Tehran, Iran
5. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran
6. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Alzheimer's disease (AD) is one of the most common types of dementia. As a result of AD, biological rhythms are disrupted, these rhythms are controlled by the suprachiasmatic nucleus (SCN), where clock genes are present, and the change in the expression of these genes can affect the severity of the disorder caused by AD. Resveratrol is an antioxidant that can reduce the disorders caused by AD and because it also affects the clock genes, therefore the aim of our study is to determine the expression of the clock genes bmal1, per1 and p53 in the SCN of male rats treated with resveratrol in the scopolamine-induced AD model.

Methods : In this research, 32 male Wistar rats were randomly placed into four groups: Cont, AD+Eth, AD, and AD+Res. AD was induced by scopolamine injection. Concorde staining was used to confirm AD. The expression of bmal1, per1 and p53 genes in the suprachiasmatic nucleus was evaluated by qRT-PCR method and also the cell count of SCN area was done by Nissel staining.

Results : The expression of bmal1 and per1 genes in SCN was significantly decreased in all groups compared to the control group, but the group treated with resveratrol increased the expression of these genes in this nucleus with a positive effect compared to AD+Eth and AD groups. Also, the expression of p53 gene was significantly increased in all studied groups compared to the control group, but resveratrol caused a significant decrease in the expression of this gene in the AD+Res group compared to the AD+Eth and AD groups. Also, Nissel staining in the SCN region indicates a significant decrease in the number of cells in this region compared to the control group.

Conclusion : The results of this study showed that resveratrol can improve the cognitive and memory disorders caused by the induction model of AD and also by controlling the expression of the central clock genes in the SCN including bmal1 and cry1, it can be effective in controlling biological rhythms.

Keywords : per1, bmal1, Suprachiasmatic nucleus, Resveratrol, Alzheimer's disease

Count: 235
Abstract ID: 594
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

"Assessing the Impact of Pegylated Niosomal Silibinin on Antioxidant Pathway Genes in Male Wistar Rats with Amyloid-Beta-Induced Neurotoxicity"

Submission Author: Keyvan Kiani

Keyvan Kiani[1], fateme abdolhosseinzadeh roveshti[2], farzaneh teymoori gharb[3]

1. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Ph.D Student of Neurosciences, Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Alzheimer's disease, a leading cause of age-related dementia, is characterized by the accumulation of amyloid-beta (Aβ) plaques in the brain. While definitive Alzheimer's treatments remain elusive, herbal remedies are gaining traction. Silibinin, a key flavonoid derived from plant seeds and found in silymarin, possesses antioxidative, anti-inflammatory, liver-protective, anticancer, and neuroprotective properties. In this investigation, we studied the impact of pegylated niosomal silibinin on the regulation of antioxidant pathway gene expression in male rats afflicted with Alzheimer's and induced with amyloid-beta (Aβ).

Methods : Forty Wistar rats were divided into five groups, each consisting of eight rats: 1. Control, 2. Alzheimer's, 3. Alzheimer's + PBS, 4. Alzheimer's + Silibinin, and 5. Alzheimer's + Pegylated Niosomal Silibinin. Following behavioral tests, the hippocampal tissue of each group was preserved at -70°C for gene expression analysis. Cresyl violet and Congo red staining were employed for histopathological assessment of hippocampal changes.

Results : The findings of this study revealed notable enhancements in spatial memory and avoidance behavior in groups receiving pegylated niosomal silibinin compared to Alzheimer's-afflicted groups. This improvement was significant and approached the performance of the control group. Amyloid beta-induced oxidative stress is known to cause memory and learning impairments, and treatment with pegylated niosomal silibinin significantly mitigated these effects. Real-time PCR results indicated a significant upregulation of SOD, GPX, and CAT genes in the pegylated niosomal silibinin-treated groups, showing a marked difference from the Alzheimer's-afflicted groups. Histopathological examinations demonstrated a reduction in amyloid plaques and a decrease in neuronal damage and death in groups receiving pegylated niosomal silibinin in comparison to Alzheimer's-afflicted groups.

Conclusion : The memory and learning deficits resulting from amyloid beta intraventricular injection are linked to the activation of the oxidative stress pathway and consequent neuronal

demise. Pegylated niosomal silibinin effectively enhanced memory and learning, potentially due to the antioxidant properties of silibinin and its capacity to cross the blood-brain barrier via niosome carriers, ultimately extending the drug's half-life through polyethylene glycol, which enhances brain tissue absorption

Keywords : silibinin, pegylated niosomal carriers, inflammasome, amyloid beta, alzheimer

Count: 236
Abstract ID: 598
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

The procyanidin improves Aβ1-42-induced long-term potentiation deficit in male rats

Submission Author: Samaneh Safari

Samaneh Safari[1], Ali Fathi Jouzdani[2], Somayeh Komaki[3], Ehteram Heydari Dana[4], Alireza Komaki[5]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
3. Department of Dermatology, School of Medicine, the University of California Davis (UC Davis), Sacramento, California USA
4. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
5. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Alzheimer's disease (AD) is the most common type of dementia in which oxidative stress plays an important role. In this disease, learning and memory and the cellular mechanism associated with it, long-term potentiation (LTP), are impaired. Considering the beneficial effects of procyanidin (PC) against AD, their effect was assessed on in vivo hippocampal LTP in the perforant pathway (PP) - dentate gyrus (DG) pathway in an Aβ1-42 - induced rat model of AD.
Methods : Male Wistar rats were randomly assigned to six groups: control, PC (50 mg/kg), AD: ICV Aβ1-42 injections, PC + AD, AD + PC, and PC + AD + PC. Administration of PC was done by gavage daily for four weeks. The population spike (PS) amplitude and field excitatory postsynaptic potentials (fEPSP) slope were determined in DG against the applied stimulation to the PP.
Results : A? impaired LTP induction in the PP-DG synapses. The percent of the changes in fEPSP slope and PS amplitude was significantly smaller in A?-treated rats than in control animals. PC consumption by the A?-treated rats enhanced the fEPSP slope and PS amplitude of the DG granular cells.
Conclusion : These data indicate that PC can ameliorate Aβ-associated changes in synaptic plasticity, possibly because of their considerable antioxidant, anticholinesterase, and anti-inflammatory activities and activation of signaling pathways significant to control synaptic plasticity.
Keywords : Alzheimer’s disease; β-Amyloid; Long-term potentiation; Hippocampus; procyanidin; Synaptic plasticity.

Count: 237
Abstract ID: 411
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Machine Learning in Alzheimer's Disease: A Comprehensive Review of GWAS Application

Submission Author: Zohre Moattar Husseini

Zohre Moattar Husseini [1], Neda Moattar Husseini [2]

1. Industrial Engineering & Management Systems, Amirkabir University of Technology, Tehran, Iran
2. Department of Microbiology, School of Biological Sciences, North Tehran Branch, Islamic Azad University, Tehran, Iran

Conclusion : Introduction: Genome-wide association studies (GWAS) are a powerful tool for identifying genetic variations linked to complex diseases like Alzheimer's Disease (AD). By analyzing the genetic makeup of large populations, GWAS can pinpoint regions of the genome associated with the disease. Machine learning (ML), a subset of artificial intelligence, has significantly enhanced the analysis of GWAS. ML algorithms can more effectively identify genetic markers, improve risk prediction, and uncover biological pathways involved in AD, providing valuable insights into the disease's genetic underpinnings. The growing interest in GWAS, combined with advancements in machine learning, has led to a surge in research examining the genetic basis of Alzheimer's Disease. Therefore, this study aims to review studies related to the effectiveness of machine learning techniques in predicting Alzheimer's disease risk using genetics based on the GWAS. Method: The primary objective of this review is to identify gaps in the existing literature, critically evaluate the methodologies and reporting of various algorithms, and lay the groundwork for a broader research initiative. By synthesizing findings from current studies, this review highlights the need for improved ML models and addresses common methodological challenges. Ultimately, it seeks to advance the understanding of genetic contributions to AD and enhance risk prediction capabilities. Results: Based on the review, there has been a notable rise in the application of machine learning to improve AD predictions. Deep learning algorithms, especially traditional artificial neural networks, are gaining prominence in GWAS analysis. Transfer learning approaches continue to be a subject of active investigation. These trends and opportunities are substantiated by the increasing number of primary studies published in recent years. Conclusion: The application of machine learning to GWAS in Alzheimer's disease not only improves classification accuracy but also facilitates the identification of complex genetic interactions that traditional methods may overlook. As these technologies continue to evolve, they hold promise for advancing diagnostic tools and therapeutic strategies for Alzheimer's disease.

Keywords : Alzheimer's Disease (AD); Genome-wide association studies (GWAS); Machine learning (ML)

Count: 238
Abstract ID: 82
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Dementia in Women Suffering from Premature Ovarian Failure

Submission Author: SeyedehSana Nasehi

SeyedehSana Nasehi[1], Sara Keshtgar[2]

1. Department of Physiology, Shiraz Medical School, Shiraz University of Medical Sciences, Shiraz, Iran; Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran.
2. Department of Physiology, Shiraz Medical School, Shiraz University of Medical Sciences, Shiraz, Iran.

Conclusion : Dementia is a general term encompassing a range of symptoms, including loss of memory and thinking abilities. Alzheimer's disease (AD), the most prevalent cause of dementia, is defined by brain abnormalities — amyloid-β (Aβ) plaques and tau protein neurofibrillary tangles — proposing to influence the neurodegenerative process actively. AD also has profound social consequences since the global cost of dementia will reach US $2 trillion by 2030. The lifetime risk of AD in females is nearly double that of men. The shift from mild cognitive decline to dementia occurs more quickly in women as the condition is more severe in them. In women, an increased risk of dementia can be linked to premature ovarian failure (POF) or early menopause. POF is linked with a 22% higher risk of dementia, while late menopause is protective and would lower the risk by 7%. The possible causes of early menopause are genetic abnormalities, infection, autoimmune and metabolic disorders, and bilateral oophorectomy. POF is characterized by elevated levels of FSH and diminished levels of 17β-estradiol (E2) in the bloodstream. E2 regulates hippocampal memory consolidation through two different pathways. First, E2 binds to its receptors (ERα and ERβ), and the estrogen-receptor complex interacts with the DNA. The second pathway occurs in or near the plasma membrane. Metabotropic glutamate receptor 1a is influenced by estrogen-receptor complex and induces cell signaling. Both pathways stimulate gene expression, protein translation, and epigenetic changes that are vital for memory formation in the hippocampus. E2 protects the brain from cognitive decline by reducing Aβ, hyperphosphorylated tau, and promoting neurogenesis. Free estradiol enhancement is associated with a reduced risk of cognitive decline. Higher sex hormone-binding globulin increases the risk by decreasing free estradiol as well. Thus, early treatment of POF or prevention of its adverse consequences may enhance the quality of life, improve patient care, and reduce AD development. Hormonal therapy, as the first-line treatment, is suggested in women with POF. When it is taken soon after menopause, it would prevent the reduction in prefrontal cortex activity. However, after menopause or in old age women (>65 years), higher total estradiol is linked with an increased risk of cognitive decline or dementia. Innovative treatment approaches, such as stem cell (SC) therapy, have been developed. SC transplantation considerably improves ovarian function in POF patients by restoring fertility, normalizing sex hormone levels, enhancing ovarian weight, and increasing the number of pregnancies. The observed benefits of SC therapy in POF can be attributed to stem cells' differentiation, homing, and paracrine function. SCs may differentiate into ovarian tissue-like cells and secret the angiogenic growth factors. However, most research on SC transplantation for POF treatment has focused on preclinical animal studies and is still

in the experimental stage. Hence, validating efficacy and safety through systematic clinical trials with adequately large sample sizes needs to be improved. Cognitive decline in women having premature ovarian failure, who are at a higher risk of getting dementia, can be prevented by early recognition of POF.

Keywords : Dementia; Cognitive decline; Premature ovarian failure; Estrogen; Stem cell

Count: 239
Abstract ID: 413
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Oral

Unraveling the Neuroprotective and Neurotoxic Effects of α-synuclein in Vascular Dementia through Behavioral Studies in Male Wistar Rats

Submission Author: Ghorbangol Ashabi

Ghorbangol Ashabi[1]

1. Tehran University of Medical Sciences

Background and Aim : Vascular dementia (VD) is a cognitive disorder caused by vascular brain damage, leading to memory impairment and anxiety. This study aims to investigate the dual role of different forms of alpha-synuclein (α-synuclein) in modulating the effects of VD and explore potential therapeutic benefits.

Methods : Fifty-six male Wistar rats underwent bilateral common carotid artery occlusion to induce chronic cerebral hypoperfusion, mimicking VD. After a month of recovery, rats received intraperitoneal injections of various forms of α-synuclein (fibrillary, monomeric, oligomeric, and mutant variants fibrillar A30P and fibrillar A53T) at a dose of 50 µg per rat. Behavioral assessments, including the open field test, elevated plus maze, novel object recognition, and Barnes maze, were conducted to evaluate anxiety, learning, and memory. Histological analyses were performed to assess neuronal viability and β-amyloid deposition.

Results : Administration of fibrillary, monomeric, and fibrillar A30P ?-synuclein led to a significant reduction in anxiety and improvement in memory and learning functions compared to the VD group. ?-amyloid deposits were significantly reduced in the monomer and A30P ?-synuclein groups. In contrast, the oligomeric and fibrillar A53T variants did not show therapeutic effects, indicating a differential impact of ?-synuclein forms on cognitive outcomes.

Conclusion : Our findings show that specific forms of α-synuclein, particularly fibrillary, and fibrillar A30P, may offer promising therapeutic strategies for alleviating cognitive deficits in vascular dementia. Further research is needed to explore the underlying mechanisms and potential clinical applications of α-synuclein in neurodegenerative disorders.

Keywords : Vascular dementia, Cognitive Dysfunction, alpha-synuclein

Count: 240
Abstract ID: 102
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Impaired Yet Complex: A Systematic Review of Emotion Recognition in Alzheimer's Disease

Submission Author: Eghlima Razeghian

Eghlima Razeghian[1]

1. University of Tehran, Department of Cognitive science

Conclusion : Background: Emotion recognition is a crucial aspect of social cognition often affected by Alzheimer's disease (AD). This systematic review aims to synthesize current research on emotion recognition in AD, highlighting key findings, limitations, and future directions. Methods: A comprehensive search of electronic databases including PubMed, Web of Science, Google Scholar, SID, and CORE was conducted for studies published between 1999 and 2023. Studies investigating emotion recognition in AD patients were included. Data extraction focused on study design, participants' characteristics, diagnostic criteria, cognitive evaluation tools, emotion recognition tasks, and key results. Results: the review included 27 from 330 studies, predominantly cross-sectional in design. Sample sizes ranged from 12 to 76 AD participants and 12 to 90 healthy controls. Most studies reported impaired emotion recognition in AD compared to healthy controls and other kinds of dementia. However, findings varied across emotions and modalities. Some studies found preserved recognition of specific emotions(e.g., Disgust) or modalities. Limitations: Heterogeneity in assessment methods, small sizes in some studies, and predominance of cross-sectional designs limit generalizability. Most studies relied on the classical theory of emotion, potentially overlooking the complexity of emotional processes. Conclusion: while general impairment in emotion recognition is evident in AD, the variability across emotions and modalities suggests a complex picture. Future research would benefit from adapting constructionist theories of emotion especially the term Core Affect and developing corresponding assessment tools to understand better the nature of emotion recognition in Alzheimer's Disease.

Keywords : Emotion Recognition; Alzheimer's Disease; Prosody Recognition,; Core Affect; Constructed theory of Emotion

Count: 241
Abstract ID: 369
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Differential Susceptibility of EOAD and Healthy Neurons to Nutrient Starvation: Insights into cis P-tau Accumulation and Pin1 Expression

Submission Author: Sabhba Shahbazi

Sabhba Shahbazi[1], Zahra Khoshkam[2], Koorosh Shahpasand[3], Mehran Habibi Rezaie[4]

1. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.
2. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.
3. Department of Brain and Cognitive Sciences, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR, Tehran, Iran.
4. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

Background and Aim : Early-onset Alzheimer's disease (EOAD) is characterized by early neurodegeneration, partially driven by tau pathology, including the hyperphosphorylation and aggregation of tau proteins. These pathological tau forms destabilize microtubules and contribute to neuronal death. Pin1, a key isomerase, plays a critical role in regulating the phosphorylation state of tau by converting the toxic cis conformation to the functional trans form. This study compared the vulnerability of iPSC-derived neurons from EOAD patients and healthy controls to nutrient starvation. The neurotoxic cis P-tau variant accumulation was assessed, and Pin1 expression was evaluated to explore potential mechanisms behind any differences in susceptibility to stress-induced neurodegeneration between EOAD and healthy neurons.

Methods : Human induced pluripotent stem cells (iPSCs) were generated from dermal fibroblasts of two patients with early-onset Alzheimer's disease (EOAD) and two age-matched healthy controls. Neurons were differentiated from these iPSCs and subjected to 96 hours of nutrient starvation. Neuronal viability was measured using the MTT assay. Western blot and immunocytochemistry were used to assess levels of cis P-tau, total tau, and Pin1.

Results : EOAD neurons demonstrated significantly higher levels of cis P-tau accumulation following nutrient starvation than healthy neurons. This increase in toxic tau species correlated with a decrease in Pin1 expression, which was more pronounced in EOAD neurons. The reduction in Pin1 expression led to the inefficient conversion of cis P-tau to its non-toxic form, exacerbating tauopathy and resulting in more significant neuronal death. In contrast, healthy neurons exhibited minimal changes in both cis P-tau levels and Pin1 expression under the same conditions.

Conclusion : Our findings reveal that iPSC-derived neurons from EOAD patients are significantly more sensitive to nutrient starvation than those from healthy individuals. This

increased vulnerability is caused by the accumulation of cis P-tau due to reduced Pin1 expression. The findings suggest that Pin1 could be a potential therapeutic target for decreasing tau-associated toxicity and reducing neurodegeneration in Alzheimer's disease.

Keywords : Early-Onset Alzheimer's Disease; Tau Protein; Neurodegeneration; Pin-1; Nutrient starvation

Count: 242
Abstract ID: 618
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Biofluid Biomarkers in Alzheimer's Disease: Current Advances and Future Directions

Submission Author: Sabhba Shahbazi

Sabhba Shahbazi[1], Zahra Khoshkam[2], Vahid Alimohammadi[3], Mehran Habibi Rezaie[4]

1. Department of Brain and Cognitive Sciences, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology, ACECR, Tehran, Iran.
2. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.
3. School of Metallurgical and Materials Engineering, Iran University of Science and Technology, Tehran, Iran.
4. Protein Biotechnology Research Lab (PBRL), Department of Cell and Molecular Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

Conclusion : Alzheimer's disease (AD) is a progressive neurodegenerative disorder and a leading cause of dementia. Identifying reliable biomarkers is critical for early diagnosis, monitoring disease progression, and evaluating the treatment efficacy of this disease. In recent years, substantial advances have been made in discovering and validating these biomarkers, including those derived from cerebrospinal fluid (CSF) and blood. This review will discuss AD biofluid biomarker research, focusing on novel approaches and their potential clinical applications. Amyloid-beta is a key biomarker of Alzheimer's pathology. Low Aβ42/Aβ40 ratio levels serve as a sensitive biomarker for detecting amyloid pathology. In addition, plasma Aβ42/Aβ40 ratios have shown potential for non-invasive diagnostics, especially with advancements in ultrasensitive technologies such as SIMOA (Single Molecule Array). Another important amyloid biomarker, Aβ oligomers, are soluble and highly toxic forms of amyloid-beta that strongly correlate with synaptic dysfunction and cognitive decline, offering insights into early disease mechanisms. Phosphorylated tau (P-tau), which includes variants such as P-tau181, P-tau 231, and P-tau217, is closely linked to tau pathology. These markers are elevated in CSF and plasma during AD. Total tau (T-tau), while indicating neuronal injury, is not specific to AD and is elevated in other neurodegenerative conditions as well. Neurodegeneration biomarkers include neurofilament light chain (NfL), a marker of axonal damage that is elevated in both CSF and blood of AD patients. Neurogranin, SNAP25, and GAP43 reflect synaptic dysfunction and are elevated in the CSF of these patients. Inflammatory and immune biomarkers include sTREM2 (soluble Triggering Receptor Expressed on Myeloid Cells 2) and GFAP (Glial Fibrillary Acidic Protein). Elevated sTREM2 levels indicate microglial activation, which is associated with the inflammatory response in AD, making it a promising biomarker for tracking disease progression. GFAP is an astrocytic marker, and its increased levels indicate glial activation and neuroinflammation, both of which are involved in AD pathology. Vascular injury biomarkers include sPDGFRβ (Soluble Platelet-Derived Growth Factor Receptor Beta), which reflects blood-brain barrier integrity, and vascular injury is another non-specific AD biomarker. Emerging biomarkers such as U-p53AZ, the unfolded

conformational variant of p53, contribute to AD pathology by impairing DNA repair and increasing vulnerability to cellular stress, particularly in response to amyloid-beta toxicity. Another early-stage biomarker is extracellular vesicles (EVs), which are detectable in both CSF and blood and carry pathological proteins like Aβ and tau. Non-coding RNAs, including miRNAs like miR-125b and miR-146a and long non-coding RNAs (lncRNAs), are promising biomarkers for Alzheimer's, reflecting disease progression. In conclusion, the landscape of Alzheimer's biomarkers has expanded significantly, but challenges remain. Heterogeneity in AD pathology, variability across different populations, and standardization in measurement techniques are critical areas that need further investigation. Moreover, combining multiple biomarkers, including genetic markers like APOE ε4 status, could enhance diagnostic accuracy and provide a more comprehensive understanding of disease mechanisms. Future research should focus on validating these biomarkers across diverse populations, improving non-invasive techniques, exploring the integration of multi-modal biomarkers, and developing more precise detection methods for these biomarkers.

Keywords : Alzheimer’s disease; Amyloid-beta; Phosphorylated tau; Neurofilament light chain; Synaptic biomarkers; Non-coding RNAs

Count: 243
Abstract ID: 265
subject: Neural Injuries and Neurodegenerative Disorders: Dementia
Presentation Type: Poster

Relationship of cognitive functions and swallowing function in people with Alzheimer's disease

Submission Author: Razie Dadfar

Razie Dadfar[1], Ahmad Reza Khatoonabadi[2], Jalal Bakhtiyari[3], Zahra Vahabi[4], Shohreh Jalaei[5], Mohammad Rahim Shahbodaghi[6]

1. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Tehran University of Medical Sciences, Tehran, Iran.
3. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Tehran University of Medical Sciences, Tehran, Iran.
4. Department of Geriatric Medicine, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
5. Department of Physical Sciences, School of Rehabilitation Sciences, Tehran University of Medical Sciences, Tehran, Iran.
6. Department of Speech and Language Pathology, School of Rehabilitation Sciences, Tehran University of Medical Sciences, Tehran, Iran.

Background and Aim : About 75% of people with Alzheimer’s disease experience swallowing disorders (dysphagia), which is one of the significant issues associated with the disease. Dysphagia can lead to dehydration, choking, aspiration, pneumonia, and even death. Cognitive ability is one of several variables that affect swallowing function. Since studies have shown that swallowing and cognition are related, one of the most effective approaches to managing dysphagia is to combine cognitive practice with swallowing therapy. Hence, identifying the cognitive functions involved in swallowing is critical. This study examined the relationship between the cognitive functions of attention, memory, and executive functions in Alzheimer's patients. Tools were used that assessed all four components of executive performance separately.

Methods : Fifty individuals with Alzheimer’s disease (25 mild, 25 moderate) participated in this cross-sectional study. All participants were diagnosed with Alzheimer’s disease according to NIAA 2011 (National Institute on Aging Alzheimer’s Disease) criteria and were categorized as mild or moderate based on FAST (Functional Assessment Staging Tool) criteria by a neurologist. Subsequently, neuropsychological and swallowing tests were administered. The neuropsychological tests used included MoCA (the Montreal Cognitive Assessment) for measuring general cognition, the Episodic Memory section of MoCA for examining episodic memory, the Digit Span Test (forward and backward) to assess working memory, the Trail Making Test (TMT) versions A and B to evaluate inhibition, the Stroop Color-Word Test for evaluating shifting, VF-animal (categorical verbal fluency (animals)), and VF-letter (A, S, F) (letter verbal fluency) to assess verbal fluency. Attention was measured using the results of the

Digit Span Test (backward) and TMT Part B. The Mann Assessment of Swallowing Ability (MASA) test was also administered to evaluate swallowing function.

Results : The correlation between neuropsychological aspects and swallowing function in the total Alzheimer's disease patient cohort showed a significant association between these cognitive tests and MASA: MoCA ($p = 0.000$, $r = 0.522$), episodic memory of MoCA ($p = 0.005$, $r = 0.387$), Stroop Color-Word Test ($p = 0.014$, $r = -0.351$), TMT part A ($p = 0.012$, $r = -0.377$), VF-A ($p = 0.007$, $r = 0.378$), VF-S ($p = 0.015$, $r = 0.342$), and VF-F ($p = 0.033$, $r = 0.303$). In mild Alzheimer's disease participants, a significant association was found between the Digit Span Test (backward) and MASA ($p = 0.004$, $r = 0.588$). However, no significant correlation was identified between neuropsychological aspects and swallowing function in patients with moderate Alzheimer's disease.

Conclusion : The results indicate a significant correlation between swallowing function and several cognitive aspects, including episodic memory, inhibition, shifting, and verbal fluency, in Alzheimer's patients. Notably, a significant correlation was found between the Digit Span Test (backward) and MASA in mild Alzheimer's patients; however, in moderate Alzheimer's patients, no correlation was identified between cognitive functions and MASA. Our study highlights the cognitive impact of dysphagia in Alzheimer's patients, emphasizing the need for a comprehensive approach that includes cognitive exercises alongside swallowing rehabilitation.

Keywords : Alzheimer's Disease, Cognitive Function, Swallowing Function.

Count: 244
Abstract ID: 121
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Investigating the anti-inflammatory effects of selegiline on diffuse brain injury in male rats: a behavioral, biochemical and histological study

Submission Author: Seyedehfatemezahra Khalilisangdehi

Seyedehfatemezahra Khalilisangdehi[1], Saeed Ehteshami[2], Ali Siahposht –Khachaki[3]

1. Medical Student, Mazandaran University of Medical Sciences, Sari, Iran
2. Assistant Professor of Neursergury, School of Medicine, Orthopedic Research Center, Mazandaran University of Medical Sciences, Sari,Iran
3. Associate Assistant Professor, imunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Traumatic brain injury (TBI) affects more than 10 million people worldwide annually, accounting for 30–40% of all injury-related deaths and disabilities among all age groups, with significant social and economic impacts. Selegiline is a monoamine oxidase inhibitor drug for the treatment of Parkinson's in the early stages. It has other side effects including antioxidant, antidepressant, anti-anxiety and anti-inflammatory effects. Therefore, in this research project, the role of selegiline in neuron protection in the process of diffuse concussion in rats and we also investigated its effect on the amount of interleukins and histological changes

Methods : After induction of anesthesia and cannulation in the trachea, 60 Wistar rats underwent diffuse trauma, and 30 minutes later, selegiline 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 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 ($P < 0.0001$).. Our findings also showed that selegiline at doses of 5 mg / kg and 10 mg / kg could reduce these differences compared to controls (Sham and Intact) ($p < 0.001$). It should be noted that selegiline was more effective at a dose of 20 mg / kg ($P < 0.0001$).

Conclusion : Based on this study, it can be found that selegiline 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 : Selegiline, Neuroprotective, Brain trauma, brain edema, interleukins

Count: 245
Abstract ID: 144
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The neuroprotective effects of Humic Acid on the neurological score,brain edema and blood brain barrier after severe traumatic brain injury in male rats:a behavioral,biochemical and histological study

Submission Author: Niloufar Ghasemimaher

Niloufar Ghasemimaher[1], Parsa Soroori [2], Ali siahposht khachaki[3]

1. Medical student ,Sari branch , Islamic Azad University, Sari ,Iran
2. Pharmacy Student, Ramsar Campus, Mazandaran University of Medical Sciences, Sari, Iran
3. imunogenetics Research Center, Departments of Physiology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

Background and Aim : Evidence suggests a therapeutic role for resveratrol in reducing behavioral abnormalities associated with TBI. Resveratrol treatment improves anxiolytic behavior and restores motor and memory deficits after childhood TBI in a rat model therefore, in this research project, we investigated the role of resveratrol in neuron protection in the process of diffuse brain injury in rats, as well as its effect on inflammatory factors

Methods : After induction of anesthesia and cannulation in the trachea, 56 Wistar rats were subjected to diffuse controlled concussion using the snake method, and 30 minutes later, resveratrol was injected intraperitoneally with different doses of cerebrospinal fluid was also collected and used for biochemical analysis from Cisterna Magna

Results : Our findings showed that resveratrol led to the reduction of inflammatory factors IL-? and anti-inflammatory factor IL-10 in CSF liquid ($P<0.0001$). Histological findings were also in the direction of reducing neuronal and perivascular edema and neurodegeneration.

Conclusion : Therefore, resveratrol can have neuroprotective properties in concussion and probably has good anti-neuronal inflammatory effects.

Keywords : resveratrol, neuroprotective, brain trauma, cerebral edema, interleukins

Count: 246
Abstract ID: 231
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

The review of effects of Sericin Hydrogel on Ischemic Stroke

Submission Author: Tannaz Haghgouei

Tannaz Haghgouei[1], siamak sandoghchian shotorbani[2]

1. Department of Pharmacology,Faculty of Veterinary Medicine,Tabriz University
2. Associate Prof, Tabriz university of medical siences

Conclusion : Sericin presents a multifaceted approach to stroke therapy by promoting neuroprotection, facilitating stem cell differentiation, and modulating inflammation. The development of sericin-based hydrogels and scaffolds offers innovative strategies for enhancing neuronal repair post-stroke. Future research should focus on optimizing sericin formulations for clinical applications and exploring its long-term effects on functional recovery in stroke patients. Overall, sericin holds considerable potential as a therapeutic agent in the field of neuroregeneration following ischemic events.

Keywords : sericin- Neuroprotective-ischemic stroke-inflammation

Count: 247
Abstract ID: 185
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

Therapeutic effect of Everolimus, an mTOR inhibitor in rats with intracerebral hemorrhage: reduced inflammation, oxidative stress, and enhanced neuroprotection

Submission Author: Fatemeh Forouzanfar

Fatemeh Forouzanfar[1], Farzaneh Vafaee[2], Shima Shirzad[3]

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

Background and Aim : Mammalian target of rapamycin (mTOR), is a key regulator in controlling homeostasis and cellular proliferation. Changes in mTOR activity are frequently observed in various neurological conditions, including stroke. Intracerebral hemorrhage (ICH) is a subtype of stroke with a high disability rate among survivors. However, new treatments are desperately needed, as none of the existing ones have been demonstrated to improve outcomes after ICH. Everolimus, an mTOR inhibitor, was applied to investigate the outcome after ICH and the possible underlying mechanism.

Methods : The ICH model was established by autologous blood injection. Everolimus was administered intraperitoneally for 14 consecutive days post-operation. The neurological functions were examined at 3, 7, and 14 days post-ICH. Brain tissue samples were collected to perform histopathological and immunohistochemical (NF-k-positive cell) examinations. Besides, the striatum was used to evaluate parameters related to oxidative stress (superoxide dismutase (SOD) activity, malondialdehyde (MDA), and total thiol levels) and inflammation markers (TNF-α and NO).

Results : Everolimus ameliorated ICH-induced neurological deficits. In addition, treatment with everolimus reduced infarct volume and NF-k-β positive cells as compared to the ICH group. Furthermore, everolimus significantly increased total thiol content and SOD activity while significantly reducing MDA, NO, and TNF- levels as compared to the ICH group.

Conclusion : Everolimus decreased oxidative stress and inflammation, and reduced neurological deficiency, thus having a protective effect on intracerebral hemorrhage.

Keywords : Everolimus; Hemorrhagic stroke; Inflammation; Neuroprotection; Oxidative stress.

Count: 248
Abstract ID: 203
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Poster

Fucoidan mitigates TBI-induced neuronal damage and memory impairments through LTP augmentation and decrement of oxidative stress in mice.

Submission Author: Shahla Eyvari

Shahla Eyvari[1], Rasool Haddadi[2], Abdolrahman Sarihi[3], Alireza Komaki[4]

1. Department of Neuroscience, School of Science and Advanced Technologies in Medicine, Student Research Committee, Hamadan University of Medical Sciences, Hamadan, Iran
2. Department of Pharmacology and Toxicology, School of Pharmacy, Medicinal plant and natural products 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 physiology, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : There is no acquiesced remedy for the treatment of traumatic brain injury (TBI)-associated impairment, especially cognitive decline. The first 24 hours after TBI is a golden time for preventing the progress of the impairments. The present study aimed to examine the acute effects of fucoidan on neurological outcomes, and memory performance, and investigate its potential mechanisms in rats with TBI.
Methods : Fucoidan (25, 50, and 100 mg/kg, i.p.) was injected immediately after TBI induction. Veterinary coma scale (VCS), brain edema, blood-brain barrier (BBB) integrity, passive avoidance memory and spatial memory, neuroplasticity, myeloperoxidase (MPO) activity, oxidative stress, and histological alteration were evaluated after TBI induction and fucoidan treatment.
Results : The findings revealed that TBI resulted in an enhancement in brain water content and BBB permeability and diminished the performance of passive avoidance memory and spatial memory. These were accompanied by long-term potentiation (LTP) suppression in the hippocampus and the prevention of activities of SOD, catalase, and GPx, and enhancement of MPO activity and lipid peroxidation in the hippocampus as well as hippocampal neuronal loss. Fascinatingly, acute treatment of TBI rats with fucoidan especially in the higher doses (50 and 100 mg/kg) significantly ameliorated ($p<0.05$) neurological outcomes of VCS, cerebral edema, BBB integrity, passive avoidance memory, spatial memory, LTP impairment, and oxidative-anti oxidative balance. Also, fucoidan significantly inhibited hippocampal neuronal loss and MPO activity as an indicator of microglial activation.
Conclusion : These outcomes imply that fucoidan can be a hopeful remedy for TBI-associated neuronal impairments. However, further research is necessary to endorse this issue.
Keywords : Traumatic brain injury; Fucoidan; Long-term potentiation (LTP); memory; Oxidative stress; MPO activity.

Count: 249
Abstract ID: 497
subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury
Presentation Type: Oral

The effect of mobile phone electromagnetic waves on spatial memory in male rats with post-traumatic stress disorder

Submission Author: Kataneh Abrari

Kataneh Abrari[1], Maryam Alimohammadi[2], Afsaneh Goudarzi[3]

1. kharazmi university
2. kharazmi university
3. shahid Beheshti university

Background and Aim : Anyone can be exposed to stressful and uncontrollable events in their life. In some cases, exposure to these events can lead to a debilitating mental disorder called post-traumatic stress disorder. Also, during the day, people in society are exposed to electromagnetic waves from various natural and artificial sources, and therefore there are concerns about the influence of these fields on the biological and molecular processes of living organisms. Previous studies indicate the destructive effect of electromagnetic waves on the pyramidal cells of the hippocampus. The hippocampus is an area involved in memory, learning and is even responsible for memory blackout, the reduction of its volume in PTSD leads to many symptoms of the disease. Therefore, the aim of the present study is to investigate the simultaneous effect of mobile phone electromagnetic waves and PTSD disease on spatial memory in adult male Wistar rats.

Methods : For this research, 40 adult male Wistar rats were used, which were divided into 4 groups: Naive group, PTSD group, EMW group, and PTSD+EMW group. A long-term single stress model (SPS) was used to induce PTSD, and a mobile phone with EGSM 1900, 900, and GSM 1800 specifications was used to induce mobile phone electromagnetic waves. The Morris water maze test (MWM) was used to evaluate the spatial memory of the animals, and the open field test (OF) was used to measure the level of fear and anxiety and exploratory behavior of the animals. The expression level of Bcl2 and BAX genes, as factors involved in apoptosis of hippocampal tissue, was measured using the polymerase chain reaction method (RT-qPCR).

Results : The results showed that spatial memory and exploratory behavior were significantly decreased in the PTSD and PTSD+EMW groups compared to the naive group. Fear and anxiety were significantly higher in this group than in the naive group. Animals chronically exposed to cell phone waves did not differ significantly from the control group in terms of performance in the Morris water maze and open field test. The Bcl2 gene expression level in PTSD and PTSD+EMW groups was lower than in the naive group, and the Bax gene level and the Bax/Bcl2 ratio in these groups were higher than in the naive group. In this regard, there was no difference between the naive and EMW groups.

Conclusion : The results show that exposure to electromagnetic waves emitted by cell phones for 50 minutes a day for 28 days has no effect on spatial memory and levels of fear and anxiety in large laboratory rats with PTSD, as well as apoptotic indices in their hippocampus.

Keywords : Post-traumatic stress disorder, electromagnetic waves, cell phone, hippocampus, Bax, Bcl2.

Count: 250
Abstract ID: 319
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Oral

The effect of transplantation of motor neuron-like cells differentiated from adipose-derived stem cells on sperm parameters and testicular histology in spinal cord injured rats.

Submission Author: Esmail Mohammadbagheri

Esmail Mohammadbagheri[1], Dr . Abbas aliaghei[2], Dr . Nourollah Rezaei [3]

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
3. Department of Anatomy & Cell Biology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran

Background and Aim : One of the common side effects of spinal cord injury (SCI) is infertility in men. Objective: To investigate the effect of transplantation of motor neuron-like cells differentiated from adipose-derived stem cells on sperm parameters and testicular histology in spinal cord injured rats.
Methods : Mesenchymal stem cells derived from the adipose tissue. After culture, its mesenchymal stem identity was confirmed by differentiation into fat, bone, and flow cytometry. Fat cells were differentiated into motor neuron-like cells in the differentiation medium and Neuronal Nuclear antigen (NeuN) and SOX2 markers were determined. 60 adult male Wistar rats with an average weight of 230-250 g were randomly divided into 10 groups: 1-Intact, 2-Sham, 3-SCI, 4-vehicle, 5-Conditioned medium (CM), 6- Conditioned medium plus (CM+), 7- Adipose-derived Stem cells (ADSCs), 8-ADSCs +CM, 9-Motor Neuron-like Cells (Diff),10-Diff+CM+. The animals were subjected to SCI after anesthesia. Depending on the type of group, cells or conditioned medium were injected. 8 weeks of BBB, Hotplate, Tail flick, and Footprint behavioral tests were performed. The rats were sacrificed and sperm parameters were checked. The spinal cord and testes were fixed in 10% formalin, section, staining, and analyzed.
Results : ADSCs were differentiated into Diff. Lesion repair in tissue sections of the spinal cord, improvement of behavioral tests, sperm parameters, and testicular histology, and Johnson's criteria were significantly better in the Diff group (group 9) compared to other treated and untreated groups. Further investigations are needed.
Conclusion : The results of this study suggest that transplanting Diff to the spinal cord injured rats can improve motor skill disorders, testicular tissue structure, and sperm parameters caused by acute spinal cord injury to some extent.
Keywords : Spinal cord injury, Sperm parameters, Testis histology, Motor neuron-like stem cells

Count: 251
Abstract ID: 648
subject: Neural Injuries and Neurodegenerative Disorders: Spinal Cord Injury
Presentation Type: Poster

Spinal Cord Perfusion Pressure after Traumatic Spinal Cord Injury, a new perspective

Submission Author: Mehrbanou Hosseinirad

Mehrbanou Hosseinirad[1], Ata Mahdkhah[2], Peyman Gholipoor[3]

1. Urmia University of Medical Sciences, Urmia, Iran
2. Department of Neurosurgery, Urmia University of Medical Sciences, Urmia, Iran
3. Department of Neurosurgery, Urmia University of Medical Sciences, Urmia, Iran

Background and Aim : We newly monitored intraspinal pressure (ISP) and spinal cord perfusion pressure (SCPP) from the injury site to compute the optimum SCPP (SCPPopt) in patients with acute traumatic spinal cord injury (TSCI). We believed that ISP and SCPPopt could be anticipated using clinical factors instead of ISP or ICP (intracranial pressure) monitoring.

Methods : 25 TSCI patients, grades A–C (American Spinal injuries association Impairment Scale, AIS), were analyzed. For 24 h after surgery, we monitored ISP and SCPP and computed SCPPopt (SCPP that optimizes pressure reactivity).

Results : All patients underwent surgery to restore normal spinal alignment within 72 hours of injury. 54 percent had U-shaped sPRx versus SCPP curves, thus allowing SCPPopt to be computed. 11 percent, all AIS grade A or B, had no U-shaped sPRx versus SCPP curves. 27 percent had U-shaped sPRx versus SCPP curves, but the SCPP did not reach the curve's minimum, and thus, an exact SCPPopt could not be calculated. Factors that were associated with lower ISP: older age, nonconus medullaris injury, expansion duroplasty, and less intraoperative bleeding. In a multivariate logistic regression model, these factors predicted ISP as normal or high with 71% accuracy—only 2 factors correlated with lower SCPPopt: higher mean ISP and conus medullaris injury. In an ordinal multivariate logistic regression model, these 2 factors predicted SCPPopt as low, medium-low, medium-high, or high with only 42% accuracy. No MRI factors correlated with ISP or SCPPopt.

Conclusion : Elevated ISP can be predicted by clinical factors. Modifiable factors that may lower ISP are: reducing surgical bleeding and performing expansion duroplasty. No factors accurately predict SCPPopt; thus, invasive monitoring remains the only way to estimate SCPPopt.

Keywords : Traumatic Spinal Cord Injury, Spinal Cord Perfusion Pressure, Intraspinal Pressure, Optimum Spinal Cord Perfusion Pressure, Pressure Reactivity

Count: 252
Abstract ID: 605
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The Effect of Subacute Administration of Zirconium Amino Benzene Dicarboxylate Framework (UIO-66-NH2) on Oxidative Stress and Expression of Inflammatory Factors in Brain Tissue of Rats

Submission Author: Mohammad EbrahimiRanjbar

Mohammad EbrahimiRanjbar[1], Maryam Ghasemi Qasman[2]

1. Student Research Committee, Babol University Of Medical Sciences, Babol 47176-47745, Iran
2. Department Of Physiology, School of Medicine, Babol University Of Medical Sciences, Babol 47176-47745, Iran

Background and Aim : UIO-66 (Universitetet i Oslo) is a subclass of metal-organic frameworks (MOFs) characterized by its large pore size, physiological stability, and biocompatibility. These attributes render UIO-66 a promising candidate for therapeutic applications. However, before any substance can be widely adopted in medical science, comprehensive evaluations of its toxicity in living organisms are imperative. This study aimed to investigate the neurotoxicity of UIO-66 and its impact on behavioral parameters, histological alterations, expression of inflammatory markers, and oxidative stress levels in a rat model.

Methods : Thirty-five male Wistar rats were allocated into five groups: a vehicle control group and four treatment groups receiving doses of 0.05, 0.1, 0.2, and 0.4 mg/kg UIO-66. Each group received five injections over two weeks via the tail vein. Behavioral assessments, oxidative stress measurements, inflammatory marker expression, and histological changes in the hippocampus were conducted. Morphological evaluation, elemental analysis, and the crystallinity of synthesized particles were examined using field emission scanning electron microscopy (FE-SEM), Fourier Transform Infrared Spectroscopy (FTIR), and X-ray diffraction (XRD). On the first and last days of injection, working memory was evaluated using the Y-Maze test. Two and three days post-final injection, social interaction was assessed with the three-chamber test for 30 minutes to explore learning and spatial memory. Biopsies were performed concurrently after completing the behavioral assessments. Astrocyte activity was quantified using the GFAP marker, and the expression levels of inflammatory genes TNF-alpha, IL-1beta, and IL-6 were evaluated in the right hemisphere of the rat brain. Total antioxidant capacity, malondialdehyde concentration, and the activities of superoxide dismutase, catalase, and glutathione peroxidase were measured to assess oxidative stress changes. Data analysis was performed using GraphPad Prism 9. The three-chamber test results were analyzed using repeated measures ANOVA with Bonferroni post-hoc tests. For other analyses, two-way ANOVA and Bonferroni post-hoc tests were employed. Histological data were assessed using Kruskal-Wallis non-parametric ANOVA with Dunn's post-hoc test. PCR data, Y-Maze, biochemical assays, and probe results were analyzed using one-way ANOVA

with Tukey post-hoc tests. A significance level of $p < 0.05$ was considered statistically significant.

Results : No significant differences were observed in spatial and working memory or social interactions among the groups receiving UIO-66 ($p > 0.05$). Molecular analyses indicated no significant increase in the expression of inflammatory genes. The number of activated astrocytes and the levels of oxidative stress did not show significant increases.

Conclusion : UIO-66 at the tested doses appears to be safe and shows potential for broad application in therapeutic contexts.

Keywords : MOF, UIO-66, Neurotoxicity, hippocampal damage, oxidative stress, neuroinflammation

Count: 253
Abstract ID: 513
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

The Dual Impact of Amitriptyline on Headache and Prolactin Levels in Patients with Migraine: A Clinical Study to Unravel the Controversies

Submission Author: Negar Emadeddin

Negar Emadeddin[1], Mohammad Forouzesh Fard [2], Raheb Ghorbani[3], Seyed Afshin Samaei[4], Samin Davoody[5]

1. School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Anesthesiology, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran
3. Department of Social Medicine, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran
4. Department of Neurology, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran
5. Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Migraine is the second most prevalent neurological disorder and the third most prevalent disease worldwide. As a leading cause of disability world-wide, it is essential to approach effective treatment and make preventive measures to improve patient care. Amitriptyline has shown efficacy in migraine prevention. However available evidence suggest that amitriptyline may elevate serum prolactin levels, which in turn might worsen the headache itself. This study aimed to investigate the effects of amitriptyline on serum prolactin levels and examine its dual relationship.

Methods : This before-after quasi-experimental study included 30 migraine patients (21 women, 9 men), treated at the Neurology Clinic of Kowsar Hospital, Semnan, Iran between 2021-2023. Diagnosis was made by expert neurologists according to the International Classification of Headache Disorders (ICHD-3). Specific inclusion and exclusion criteria was implemented. Patients received amitriptyline (5, 10, or 25 mg/day for 8 consecutive weeks). Serum prolactin levels, headache frequency, and the severity of headaches and their impact on daily life was measured before and after treatment by the ELISA method, number of headache days in the last month, and HIT-6 questionnaire respectively. Data analysis was performed using the Shapiro-Wilk test, Wilcoxon signed-rank test, paired t-test, Pearson correlation coefficient, Kolmogorov-Smirnov test, and multiple linear regression. A p-value less than 0.05 was considered statistically significant. This study received approval from the Institutional Committee on Ethics and Research of the Semnan University of Medical Science (IR.SEMUMS.REC.1400.186) and the Iranian Registry of Clinical Trials (IRCT20211013052758N1).

Results : Following amitriptyline treatment, HIT-6 scores significantly decreased (from 62.6 to 54.0; p = 0.04), indicating an improvement in the severity of headaches and their impact on daily life. Repeated measures ANOVA demonstrated a significant reduction in headache frequency irrespective of amitriptyline dosage (p = 0.01). A dose-dependent effect on prolactin levels was observed: patients taking higher doses experienced a decrease in prolactin levels, while those on lower doses showed an increase (p = 0.042). However, no significant correlation was found between changes in prolactin levels and headache frequency or HIT-6 scores. The most commonly reported side effects were drowsiness (60%, n=18) and dry mouth (40%, n=12), with no critical side effects reported.

Conclusion : Amitriptyline effectively reduced migraine frequency and improved quality of life in patients, regardless of changes in serum prolactin levels. A dose-dependent relationship between amitriptyline dosage and prolactin changes was observed, but these changes did not significantly impact headache outcomes. Further research is needed to elucidate the role of prolactin in migraine pathophysiology and optimize preventive treatment strategies.

Keywords : Migraine; Amitriptyline; Prolactin; Prevention; Clinical Study

Count: 254
Abstract ID: 227
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Arbutin intervention ameliorates memory impairment in a rat model of lysolecethin induced demyelination: Neuroprotective and anti-inflammatory effects

Submission Author: Sahand Ashrafpour

Sahand Ashrafpour[1], Fereshteh Pourabdolhossein[2], Mohammad-Javad Nasr-Taherabadi[3], Alie Sabouri-Rad[4], Soheila Hosseinzadeh[5]

1. Mobility Impairment Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
2. Department of Physiology, School of Medicine, Babol University of Medical Sciences, Babol, Iran
3. Student Research Committee, Babol University of Medical Sciences, Babol, Iran
4. Student Research Committee, Babol University of Medical Sciences, Babol, Iran
5. Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : Cognitive impairment (CI) and memory deficit are prevalent manifestations of multiple sclerosis (MS). This study explores the therapeutic potential of arbutin on memory deficits using a rat hippocampal demyelination model induced by lysophosphatidylcholine (LPC).

Methods : Demyelination was induced by bilateral injection of 1% LPC into the CA1 area of the hippocampus, and the treated group received daily arbutin injections (50 mg/kg, i.p) for two weeks. Arbutin significantly improved memory impairment 14 days post-demyelination as assessed by Morris water maze test.

Results : Histological and immunohistochemical analyses demonstrated that arbutin reduced demyelination suppressed pro-inflammatory markers (IL-1β, TNF-α) and increased anti-inflammatory cytokine IL-10. Arbutin also diminished astrocyte activation, decreased iNOS, enhanced anti-oxidative factors (Nrf2, HO-1), and exhibited neuroprotective effects by elevating myelin markers (MBP) and brain derived neurotrophic factor (BDNF).

Conclusion : These findings propose arbutin as a potential therapeutic candidate for multiple sclerosis-associated memory deficits, warranting further clinical exploration.

Keywords : Arbutin; Demyelination; Neuroinflammation; Memory deficit; Oxidative stress; Neuroprotection

Count: 255
Abstract ID: 507
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Tramadol induces apoptosis, inflammation, and oxidative stress in rat choroid plexus

Submission Author: Fatemeh Zolfaghari

Fatemeh Zolfaghari[1], Abbas Aliaghaei [2], Meysam Hassani Moghaddam[3], Maryam Mehranpour[4], Mohammad Amin Abdollahifar[5], Mitra salehi[6]

1. Shahid Beheshti University of Medical Sciences
2. Shahid Beheshti University of Medical Sciences
3. AJA University of Medical Sciences
4. Islamic Azad University
5. Shahid Beheshti University of Medical Sciences
6. Islamic Azad University

Background and Aim : The choroid plexus (CP) is the principal source of cerebrospinal fluid (CSF). It can produce and release a wide range of materials, including growth and neurotrophic factors which have a crucial role in the maintenance and proper functioning of the brain. Tramadol is a synthetic analog of codeine, mainly prescribed to alleviate mild to moderate pains. Nevertheless, it causes several side effects, such as emotional instability and anxiety.

Methods : In this study, we focused on alterations in the expression of inflammatory and apoptotic genes in the CP under chronic tramadol exposure. Herein, rats were treated daily with tramadol at 50 mg/kg doses for three weeks. CSF samples were collected, with superoxide dismutase (SOD) and glutathione (GSH) measured in the CSF. In the next step, CP tissue extracted and stereology, immunohistochemistry, Real Time PCR and transmission electron microscopy (TEM) analysis were done.

Results : We found that tramadol reduced the SOD and GSH levels in the CSF. Furthermore, the stereological analysis revealed a significant increase in the CP volume, epithelial cells, and capillary number upon tramadol administration. Tra¬madol elevated the number of blob mitochondria in CP. Also, we observed the upregulation of inflammatory and apoptosis genes following tramadol administration in the CP.

Conclusion : Our findings indicate that tramadol induces neurotoxicity in the CP via apoptosis,

Keywords : Superoxide dismutase · Glutathione · CSF; epithelial cells · Capillaries · Neurotoxicity

Count: 256
Abstract ID: 485
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Investigating the effect of crocin on the proliferation and differentiation of neural progenitor stem cells in wistar rats

Submission Author: Seyedehfatemeh Mirsafi

Seyedehfatemeh Mirsafi[1], Ehsan Ehsani[2], Akram Eidi[3], Koorosh Shahpasand[4]

1. Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Department of Biology, Roudehen Branch, Islamic Azad University, Tehran, Iran.
3. Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran.
4. Department of Stem Cells and Developmental Biology, Cell Science Research Center, Royan Institute for Stem Cell Biology and Technology (RI-SCBT), Tehran, Iran.

Background and Aim : The presence of neural progenitor stem cells (NPCs) in parts of the adult brain has raised the hope of treating and recovering defects and diseases related to the central nervous system and degenerative diseases such as Parkinson's, Alzheimer's and MS. On the other hand, helping to speed up the multiplication and differentiation of these cells with a therapeutic point of view is another progressive issue that increases these hopes. Crocin is a chemical substance isolated from saffron, which has many restorative, inhibitory and protective effects on some diseases, including nerve damage, compensation of oxidative stress, inhibition of cancer, as well as cell biological processes such as differentiation and proliferation, investigation and It has been proven. The aim of this research is to investigate the effect of this substance on the proliferation and differentiation of subventricular cells in the brain of rats in a dose-dependent manner.
Methods : In this study, neural progenitor cells (NPCs) were extracted from wistar rats and cultured according to the standard protocol. Concentrations of 0.5, 1 and 2µM crocin were added to the culture media to compare its proliferation and differentiation effect with the control after one week. After determining cell identity by examining gene expression and examining cell survival status by MTT test, counting and quantifying cell images by Motic software, the significance of differences was examined by SPSS software.
Results : The results showed that the amount of differentiation effect is different in various concentrations. So that the concentration of 0.5 µM has the least discrimination effect. From the concentration of 1 µM and above, the differentiation effect is increased, but the proliferation inhibition also occurs. The highest inhibition was observed at a concentration of 2 µM.
Conclusion : It seems that this substance is one of the most important medicinal compounds in accelerating the healing of nerve damage that is associated with cellular stress conditions such as inflammation and the presence of oxidative groups. This situation is very common in some diseases of the central nervous system such as trauma, MS, Alzheimer's and Parkinson's.
Keywords : Crocin, differentiation, proliferation, neural progenitor cell, rat

Count: 257
Abstract ID: 535
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Mesenchymal stem cell-derived exosomes inhibit α-synuclein aggregation: A potential therapeutic strategy for Parkinson's disease

Submission Author: Kimia Marzookian

Kimia Marzookian[1], Farhang Aliakbari[2], Dina Morshedi[3]

1. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran.
2. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran.
3. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran.

Background and Aim : Exosomes (Ex), naturally occurring extracellular vesicles, have emerged as promising drug delivery carriers for neurodegenerative diseases due to their biocompatibility, ability to cross biological barriers, and direct interaction with cellular membranes. This study focuses on the potential of mesenchymal stem cell-derived exosomes (MSCs-Ex) to inhibit α-synuclein (αSN) aggregation, a significant factor in the pathology of Parkinson's disease.
Methods : MSCs were isolated from human umbilical cord tissue by explant culture method, and exosomes were extracted from their culture media using a commercial kit (Exo-spin™). Biophysical and biochemical techniques, including flow cytometry, dynamic light scattering and Western blotting, thioflavin T, and transmission electron microscopy (TEM), were employed to assess MSCs and exosome characteristics and their effects on αSN aggregation. Additionally, wound healing assays were conducted to evaluate the impact of exosome treatment on brain microvascular endothelial cell migration.
Results : The findings revealed that MSCs-Ex significantly reduced αSN fibrillation and secondary nucleation. However, they did not promote the disaggregation of pre-formed fibrils. The mechanism appears to involve interactions between exosomes and αSN through their lipid membranes and surface proteins. Furthermore, exosome treatment enhanced the migration of brain microvascular endothelial cells by rebuilding collective movement and cell cohesion, reducing the negative effects of αSN aggregates on wound healing.
Conclusion : This study highlights the therapeutic potential of MSCs-Ex in neurodegenerative diseases, emphasizing their ability to inhibit αSN aggregation and improve endothelial cell function. These findings suggest that exosomes may provide a promising strategy for drug delivery to the brain and for addressing the challenges associated with neurodegenerative disorders.
Keywords : α-Synuclein, Aggregation inhibition, Exosomes, Mesenchymal Stem Cells, Parkinson's Disease, Neurodegeneration.

Count: 258
Abstract ID: 57
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The neuroprotective effect of Diosgenin in the rat Valproic acid model of autism

Submission Author: Mohammed Reza Naghdi badi

Mohammed Reza Naghdi badi[1]

1. Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran.

Background and Aim : Autism spectrum disorder (ASD) is a neurodevelopmental disorder with two core behavioral symptoms restricted/repetitive behavior and social-communication deficit. The unknown etiology of ASD makes it difficult to identify potential treatments. Valproic acid (VPA) is an anticonvulsant drug with teratogenic effects during pregnancy in humans and rodents. Prenatal exposure to VPA induces autism-like behavior in both humans and rodents. This study aimed to investigate the protective effects of Diosgenin in prenatal Valproic acid-induced autism in rats.

Methods : pregnant Wister female rats were given a single intraperitoneal injection of VPA (600 mg/kg, i.p.) on gestational day 12.5. The male offspring were given oral Dios (40 mg/kg, p.o.) or Carboxymethyl cellulose (5 mg/kg, p.o.) for 30 days starting from postnatal day 23. On postnatal day 52, behavioral tests were done. Additionally, biochemical assessments for oxidative stress markers were carried out on postnatal day 60. Further, histological evaluations were performed on the prefrontal tissue by Nissl staining and Immunohistofluorescence.

Results : The VPA-exposed rats showed increased anxiety-like behavior in the elevated plus maze (EPM). They also demonstrated repetitive and grooming behaviors in the marble burying test (MBT) and self-grooming test. Social interaction was reduced, and they had difficulty detecting the novel object in the novel object recognition (NOR) test. Also, VPA-treated rats have shown higher levels of oxidative stress malondialdehyde (MDA) and lower GPX, TAC, and superoxide dismutase (SOD) levels. Furthermore, the number of neurons decreased and the ERK signaling pathway upregulated in the prefrontal cortex (PFC). On the other hand, treatment with Dios restored the behavioral consequences, lowered oxidative stress, and death of neurons, and rescued the overly activated ERK1/2 signaling in the prefrontal cortex.

Conclusion : Chronic treatment with Dios restored the behavioral, biochemical, and histological abnormalities caused by prenatal VPA exposure.

Keywords : Autism spectrum disorder; Diosgenin; Oxidative stress.

Count: 259
Abstract ID: 693
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Melatonin ameliorates Methamphetamine toxicity through inhibition of pyroptosis pathway

Submission Author: Mitra AnsariDezfouli

Mitra AnsariDezfouli[1]

1. Department of Neurology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background and Aim : Methamphetamine (Meth) is a highly addictive psychostimulant and induces neuroinflammatory responses. Melatonin is a neurohormone that has protective effects and reduces the inflammation in the central nervous system. Our study focused the melatonin effect on memory impairment, NLRP3/IL-1β axis and pyroptosis in the hippocampus of rat model of Meth use.

Methods : Meth and melatonin were administered to the rats for 21 consecutive days. The memory was evaluated using alternation behavior in Y-maze. NLRP3 and IL-1β were evaluated by western blotting and ELISA respectively. Gasdermine D and caspase-1 expression levels were evaluated using qRT-PCR.

Results : The NLRP3 and IL-1β were elevated in the hippocampus following Meth injection. Moreover, Meth increased gasdermine D and caspase-1 expression levels. After 21 days of Meth use, memory impairment was seen in the Y-maze test. Melatonin significantly improved memory and decreased the expression of NLRp3, IL-1β, gasdermine D and caspase-1 in the hippocampus.

Conclusion : Our study revealed that inflammasome formation and pyroptosis pathway are involved in Meth-induced neurotoxicity. Melatonin may be a potential treatment against neurotoxicity and cognitive disorders caused by Meth.

Keywords : Methamphetamine, Melatonin, NLRP3, Interlukine-1β, Working memory, Pyroptosis

Count: 260
Abstract ID: 517
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Amelioration of behavioral and histological impairments in somatosensory cortex injury rats by limbal mesenchymal stem cell transplantation

Submission Author: Mansoureh Sabzalizadeh

Mansoureh Sabzalizadeh[1]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Cortical lesions can cause major sensory and motor impairments, representing a significant challenge in neuroscience and clinical medicine. Limbal mesenchymal stem cells (LMSCs), renowned for their remarkable ability to proliferate and distinct characteristics within the corneal epithelium, offer a promising opportunity for regenerative treatments. This study aimed to assess whether the transplantation of LMSCs could improve tactile ability in rats with lesions of the barrel cortex.

Methods : In this experimental study, we divided 21 rats into three groups: a control group, a lesion group with cortical cold lesion induction but no stem cell treatment, and a group receiving LMSC transplantation following cold lesion induction. We conducted 3-week sensory assessments using a texture discrimination test and an open-field test. We also performed Nissl staining to assess changes on the cellular level.

Results : Rats in the LMSC transplantation group demonstrated significant improvements in their ability to discrimination textures during the second and third weeks compared to those in the lesion group. The open-field test results showed an increased exploratory behavior of rats in the LMSC transplantation group by the third week compared to the lesion group. Additionally, Nissl staining revealed cellular alterations in the damaged cortex, with a significant distinction observed between rats in the LMSCs and lesion group.

Conclusion : The findings suggest that LMSC transplantation enhances sensory recovery in rats with cortical lesions, particularly their ability to discriminate textures. LMSC transplantation benefits brain tissue reparation after a cold lesion on the somatosensory cortex.

Keywords : cold lesion; limbal mesenchymal stem cell; somatosensory cortex; cognitive impairment

Count: 261
Abstract ID: 490
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Agmatine improves liver and neuronal damage in a hepatic encephalopathy induced by bile duct ligation

Submission Author: Sepideh Ganjalikhan hakemi

Sepideh Ganjalikhan hakemi[1], Majid Asadi-Shekaari[2], fahimeh pourjafari[3], Gholamreza Asadikaram[4], Masoumeh Nozari[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. Department of Anatomical Sciences, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran
4. Department of Biochemistry, Afzalipour School of Medicine, 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 the current study, we investigate whether oral administration of agmatine could effectively reduce motor and cognitive deficits induced by bile duct ligation (BDL) in an animal model of hepatic encephalopathy (HE) through neuroprotective mechanisms.
Methods : The Wistar rats were divided into four groups: sham, BDL, BDL+ 40 mg/kg Agmatine, and BDL+ 80 mg/kg Agmatine. The BDL rats were treated with agmatine from two weeks after the surgery for four consecutive weeks. The open field, rotarod, and wire grip tests were used to assess motor function and muscle strength. The novel object recognition test (NOR) was performed to evaluate learning and memory. Finally, blood samples were collected for analysis of the liver markers, the animals were sacrificed, and brain tissues were removed; the CA1 region of the hippocampus and cerebellum were processed to identify apoptosis and neuronal damage rate using caspase-3 immunocytochemistry and Nissl staining.
Results : The serological assay results showed that BDL severely impaired the function of the liver. Based on histochemical findings, BDL increased the neuronal damage in CA1 and Purkinje cells, while apoptosis was significantly observed only in the cerebellum. Agmatine treatment prevented the increase of serum liver enzymes, balance deficits, and neuronal damage in the brain areas. Apoptosis partially decreased by agmatine, and there were no differences in the performance of animals in different groups in the NOR.
Conclusion : The study suggests agmatine as a potential treatment candidate for HE because of its neuroprotective properties and/or its direct effects on liver function.
Keywords : Bile duct ligation (BDL); Agmatine; Hepatic Encephalopathy;

Count: 262
Abstract ID: 183
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The Role of Epigenetics in the Molecular Pathways of Huntington's Disease: From Mechanisms to Therapeutic Interventions

Submission Author: Maryam Rasouli

Maryam Rasouli[1]

1. Department of Genetics, Faculty of Advanced Science and Technology, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

Conclusion : Huntington's disease is a neurodegenerative disorder characterized by motor dysfunction, cognitive decline, and psychiatric disturbances. Recent epigenetic advances have considerably shed light on the molecular mechanism of HD and established epigenetic modifications as important players in the pathogenesis of the disease. This review begins with the complex epigenetic landscape in HD, specifically focusing on DNA methylation, histone modifications, and non-coding RNAs. It then throws light on their influence on gene expression and neuronal function. DNA methylation patterns in HD patients alter the expression levels of major genes involved in neuronal survival and synaptic plasticity. Other active histone modifications include acetylation and methylation, further contributing to the dysregulation of chromatin structure and gene transcription. These epigenetic changes evolve during the course of the disease and, therefore, are not static; they have a great bearing on the severity and onset of symptoms. Two subclasses of ncRNAs are microRNAs and long non-coding RNAs, which have been identified to play a critical role in the regulation of gene expression with regard to HD, acting as epigenetic regulators through affects on mRNA stability and translation. Perhaps one of the most exciting therapeutic prospects for HD involves targeting epigenetic modifications. Epigenetic drugs, a new class of drugs also called "epidrugs," include histone deacetylase inhibitors and DNA methyltransferase inhibitors that have been effective in reinstating proper patterns of gene expression to improve neuronal function in preclinical models. Clinical trials with these epidrugs are now testing their safety and efficacy in HD patients in hopes of pursuing new therapeutic avenues. Knowledge of the role of epigenetics in the molecular pathways of HD thus provides important insights into its pathogenesis and hence opens new avenues for therapeutic intervention. Future studies into the dynamic nature of epigenetic changes in HD will have to focus on the development of targeted therapies with the capability to modify such alterations to stop or reverse disease processes.

Keywords : Epigenetics; Huntington's Disease; DNA Methylation; Therapeutic Interventions

Count: 263
Abstract ID: 182
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

3-acetylpyridine induced behavioral dysfunction and neuronal loss in the striatum and hippocampus of adult male rats

Submission Author: Esmail Mohammadbagheri

Esmail Mohammadbagheri[1], Dr . Abbas aliaghei[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 : 3-acetylpyridine (3-AP) is a neurotoxin that is known to mainly affect the inferior olivary nucleus (ION) in the brain stem. Although several studies have explored the effect of this neurotoxin, still further investigation is required to understand the impact of this toxin on different parts of the brain.

Methods : In this research, two groups of rats were studied, the 3-AP-treated and the control groups. Behavioral, stereological, and immunohistochemical analyses were performed . Rats receiv 3-AP . Behavioral, stereological, and immunohistochemical analyses were performed

Results : The locomotor activity of the 3-AP-treated rats decreased whereas their anxiety levels were higher than in normal controls. Also, memory performance was impaired in animals in the 3-AP group. Microscopic observations showed a decline in the numerical density of neurons in the hippocampus and striatum along with gliosis.

Conclusion : The present study has assessed the effects of administering 3-AP to rats. The findings of this study implies that 3-AP had detrimental impacts on the neuronal function and activity in various regions of the brain including hippocampus and striatum. The effects of 3-AP on rats' short- and long-term memory, locomotion, and anxiety-like behavior were all observed. Stereological examinations in this study demonstrated a decrease in the number of neurons and an increase in the density of glial cells

Keywords : 3-acetylpyridine; Corpus striatum; Inferior olivary nucleus; Hippocampus; Memory impairment; Movement disorder

Count: 264
Abstract ID: 723
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Dexpanthenol's protective function against doxorubicin-induced neurotoxicity through modulation of the AKT/CREB/BDNF signaling pathway and the restoration of NRF2 levels

Submission Author: Amin Mokhtari

Amin Mokhtari[1]

1. Torbat Jam Faculty of Medical Sciences, Torbat Jam, Iran

Background and Aim : Doxorubicin (Dox)-induced neurotoxicity has been reported during chemotherapy. Dexpanthenol (Dex) is an alcoholic analog of pantothenic acid that exhibits protective effects. This study aimed to investigate various molecular mechanisms of Dex against Dox-induced neurotoxicity through the protein kinase B (AKT)/cyclic AMP-regulated element binding protein (CREB)/brain-derived neurotrophic factor (BDNF) pathway.

Methods : Thirty-two adult Wistar albino rats were distributed into four groups: control, Dox, Dox+Dex, and Dex groups. 2.5 mg/kg Dox was applied 3 times a week for 2 weeks, while 500 mg/kg DEX was administered every day. Cerebral cortex and cerebellum tissues were collected for histopathological examination and immunohistochemical assessment of nuclear factor kappa B (NF-κB) and inducible nitric oxide synthase (iNOS). Total antioxidant status (TAS) and total oxidant status (TOS) were measured spectrophotometrically in the cortical tissue. Changes in the gene expression of AKT, CREB, BDNF, and nuclear factor erythroid 2–related factor 2 (NRF2) were evaluated with qRT-PCR.

Results : Increased expressions of NF-κB and iNOS in the Dox group were ameliorated by Dex. In the Dox+Dex group, TAS levels were significantly higher, while TOS and oxidative stress index levels were significantly lower than the Dox group. AKT, CREB, BDNF, and NRF2 gene expressions were significantly higher in the Dox+Dex group compared to the Dox group.

Conclusion : According to these results, Dex may provide neuroprotection by activating CREB/BDNF and alleviate oxidative stress via AKT-mediated NRF2 synthesis.

Keywords : neurotoxicity; inflammation; oxidative stress; pantothenic acid

Count: 265
Abstract ID: 447
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Oral

Neuroprotective effects of Aripiprazole on colitis and associated depression in rats

Submission Author: Parvaneh RahimiMoghaddam

Parvaneh RahimiMoghaddam[1], Afrooz Mohammadgholi-Beiki[2], Mohammad Sheibani[3]

1. Department of Pharmacology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Department of Pharmacology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
3. Department of Pharmacology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Aripiprazole (ARP), an atypical antipsychotic, shows various anti-inflammatory properties and may be useful in treating major depressive disorder. This study aimed to evaluate the protective effects of ARP on TNBS-induced colitis and subsequent depression in rats,

Methods : Fifty-six male Wistar rats were used, and all groups except for the normal and sham groups received a single dose of intra-rectal TNBS. Three different doses of ARP and dexamethasone were injected intraperitoneally for two weeks in treatment groups. On the 15th day, behavioral tests were performed to evaluate depressive-like behaviors. Colon ulcer index and histological changes were assessed. The tissue levels of inflammatory cytokines, KP markers, lipopolysaccharide (LPS) and nuclear factor-kappa-B (NF-κB) were evaluated in the colon and hippocampus.

Results : TNBS effectively induced intestinal damages and subsequent depressive-like symptoms in rats. TNBS treatment significantly elevated the intestinal content of inflammatory cytokines and NF-κB expression, dysregulated the KP markers balance in both colon and hippocampus tissues, and increased the serum levels of LPS. However, treatment with ARP for 14 days successfully reversed these alterations,

Conclusion : ARP could alleviate IBD-induced colon damage and associated depressive-like behaviors mainly via suppressing inflammatory cytokines activity, serum LPS concentration, and affecting the NF-κB/kynurenine pathway.

Keywords : Inflammatory bowel disease, Depression, Aripiprazole, Inflammation, Kynurenine pathway, Rat

Count: 266
Abstract ID: 444
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Air-borne PM2.5 particles of Tehran induce AD-associated cellular perturbations

Submission Author: Zahra Khoshkam

Zahra Khoshkam[1], Sahba Shahbazi[2]

1. Department of Plant, Cell, and Molecular Biology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran.
2. Department of Cell and Molecular Biology, Faculty of Biology, College of Science, University of Tehran, Tehran, Iran.

Background and Aim : Alzheimer's disease (AD) is an increasingly multifactorial disease with the majority of cases (>95%) belonging to sporadic and non-familial types. Air pollution and fine particulate matter (PM2.5) are recognized as one of the main environmental risk factors for AD and other neurodegenerative diseases. Tehran is an over-populated and polluted megacity in Iran with high levels of PM2.5 particles during cold seasons which is a very concerning issue for long-term exposure influences on AD increases. Airborne PM2.5 has been implicated in many adverse health effects on humans and annual mortality rates. Numerous cellular and molecular symptoms play a role in developing Alzheimer's disease, including an increase in amyloid plaques, neurofibrillary tangles, and neuronal death. This study aims to investigate the direct effects of PM2.5 particles collected from a central part of Tehran on some AD-associated cellular perturbations.

Methods : For this purpose, PM2.5 particles were collected in cold seasons using a high-volume sampler, extracted by a new multi-solvent approach, and used for chemical analysis and oxidative potential assay. Neuroblastoma SH-Sy5y cells are used as a cellular model for investigating neurotoxicity, increased lipid peroxidation, and endoplasmic reticulum stress. Further, we analyzed the PM2.5 treated cells for expression of β-secretase or BACE1 gene as an important molecular marker of AD induction.

Results : Our studies showed that the extracted PM2.5 sample contains a wide range of compounds, including ionic compounds, various heavy and toxic metals, and polycyclic aromatic hydrocarbons (PAHs) with significantly high oxidative potential in non-cellular assays. In addition, we observed its neurotoxic effects with IC50 value in the MTT assay calculated as 62.83 µg/ml. Malondialdehyde (MDA) production as a marker of lipid peroxidation was determined and the results revealed a dose-dependent MDA increase for PM2.5 treated cells compared to non-treated samples with statistically significant production of about 2.5 to 6.9 nmol MDA for various concentrations between 50 to 100 µg/ml of PM2.5 compared to 1.3 nmol in control cells. A significant increase in endoplasmic reticulum stress as an indicator of unfolded protein accumulation was also determined in PM2.5 exposed cells using a microscopic fluorescence-based assay. Moreover, our molecular transcript analysis of

PM2.5 treated cells has revealed a statistically significant increase in expression fold change of BACE1 in cells exposed to 62.5 and 75 µg/ml of PM2.5 particle concentrations compared to non-treated controls.

Conclusion : BACE1 expression is frequently reported to be upregulated in brain samples of patients with AD. We revealed that Tehran has an extremely high level of PM2.5 particles with a complicated chemical profile and high oxidative and neurotoxic potential. Consequently, the increased levels of the examined AD-associated markers in PM2.5 exposed cells as well as ER stress induction and BACE1 expression increase may also confirm PM2.5's harmful effects on long-term exposure for AD promotion. Our finding is consistent with other similar post-mortem and in vivo studies indicating PM2.5 effects on AD-associated processes.

Keywords : Alzheimer's disease; PM2.5 particles; Neurotoxic potential; Lipid peroxidation; ER stress; BACE1

Count: 267
Abstract ID: 479
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Prophylactic Effect of Memantine in Docetaxel induced Neuropathy in Patients with Breast Cancer

Submission Author: Mahdiyeh Nozad

Mahdiyeh Nozad[1], Elnaz Shaseb[2], Zohreh Sanaat[3], Parvin Sarbakhsh[4], Nasrin Gholami[5], Farideh Akbari[6], Samineh Beheshtirouy[7], Saba Ghaffary[8]

1. Student research committee, School of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran
2. Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Hematology and Oncology, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Statistics and Epidemiology, Tabriz University of Medical Sciences, Tabriz, Iran
5. Hematology and Oncology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
6. Hematology and Oncology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
7. Department of Clinical Pharmacy, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran
8. Hematology and Oncology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Peripheral neuropathy is a complication of taxane that in severe cases can limit the optimal treatment. The aim of this study was to evaluate the efficacy of memantine in prevention of docetaxel induced peripheral neuropathy in patients with breast cancer.
Methods : In this randomized clinical trial, 40 women between the ages of 18 and 64 years with non-metastatic breast cancer (stages I to III) were included (registry number: IRCT20160310026998N9 and registry date: 26 March 2019). All patients were treated with the AC-T regimen (with docetaxel). Patients in intervention group received memantine at a dose of 20 mg for 8 weeks at the beginning of the first cycle of docetaxel. Patients in control group did not take any medication for neuropathy prevention. To assess the neuropathy, DN4 and CTCAE questionnaires were used at baseline, one months, three months and six months after the intervention.
Results : The DN4 questionnaire score was remarkably less in memantine group in follow up one (p-value: 0.033) and three (p-value< 0.001). The CTCAE follow up score did not change during study. The Neuropathy duration and Neuropathy onset, were shown significant difference between the intervention and control groups, p-value: 0.050 and p-value: 0.001, respectively. From 40 patients, 8 (40%) in memantine group and 2 (10%) in control group, did not experience any kind of neuropathy.
Conclusion : Data showed that prophylactic administration of memantine 20 mg/day has been effective in prevention of severity and incidence of docetaxel induced neuropathy in patients with breast cancer.
Keywords : Memantine; Neuropathy; Docetaxel; Breast cancer; Taxane

Count: 268
Abstract ID: 526
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

Sleep deprivation increases neuroinflammation in the hippocampus of rats

Submission Author: Mahdi Khanmohammadi

Mahdi Khanmohammadi[1], Elmira Beirami[2], Neda Valian[3], Samaneh Nabavi Fard[4]

1. -
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Sleep is a complex physiological state characterized by two main types: non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. NREM sleep is crucial for physical recovery, while REM sleep is associated with dreaming and cognitive function. Despite extensive research, the exact mechanisms and functions of sleep are only partially understood, indicating that it is essential for mental and physical well-being. While sleep is often viewed as a passive state, it is an active process that plays a critical role in various biological functions, highlighting the need for further exploration of its complexities and implications for health. Sleep deprivation has emerged as a global public health challenge with far-reaching effects on various aspects of human health. The aim of this study was to assess the expression of neuroinflammatory factors, specifically TNF-α and IL-6, in the hippocampus of sleep-deprived rats.

Methods : To achieve this, the male Wistar rats were divided into three groups: 1) control rats without sleep deprivation; 2- sham rats placed on a metal plate located on the columns of the apparatus without inducing sleep deprivation; and 3) sleep-deprived rats placed on the columns of the apparatus to induce sleep deprivation. The sleep deprivation model was induced using a multiple-platform device containing 14 columns, with the rats placed on the apparatus for 21 consecutive days from 4 p.m. to 10 a.m. The expression of neuroinflammatory factors (TNF-α and IL-6) was measured using the ELISA method.

Results : The results demonstrated that chronic sleep deprivation led to a significant increase in the levels of neuroinflammatory factors in the hippocampus of sleep-deprived rats.

Conclusion : This study highlights the link between sleep deprivation and increased neuroinflammation.

Keywords : Sleep deprivation, Hippocampus, Neuroinflammation, Rats

Count: 269
Abstract ID: 289
subject: Neural Injuries and Neurodegenerative Disorders: Neurotoxicity, Neuroprotection, Inflammation
Presentation Type: Poster

The effects of acute and chronic administration of morphine mu mRNA expression levels in the lumbar spinal cord of intact and gonadectomized male rats in the absence and presence of inflammation

Submission Author: Somayeh Vazifehkhah

Somayeh Vazifehkhah[1], Mohadeseh Chahkandi[2], Nayereh Askari[3]

1. Department of Basic Sciences, Faculty of Medicine, Sari Branch, Islamic Azad University, Sari, Iran
2. Cellular and Molecular Research Center, Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran.
3. Department of Biology, Faculty of Sciences, Shahid Bahonar University of Kerman, P.O.Box 76135-133, Kerman, Islamic Republic of Iran

Background and Aim : The use of opioids in pain management is associated with challenges such as tolerance, addiction, and immunosuppression. Since the primary target of opioids is their receptors, a better understanding of their effects on these receptors can help manage opioid use (1, 2). Among opioids, morphine is one of the most effective analgesic drugs, and its physical dependence and psychological addiction are of interest (3). Studies have shown that in the spinal cord, analgesia produced by morphine at normal analgesia doses is mediated by MOR (mu-opioid receptor), but at higher doses, it is made by opioid receptor capacity (4,5). Studies have also shown modifications in MOR and KOR (kappa-opioid receptor) gene expression during morphine administration. The analgesic effect of opioids has been a recognized fact for centuries (6), but what is interesting is their effect in reducing inflammation and enhancing the analgesic effect of opioids in the presence of inflammation (7). Research has shown that hind foot inflammation increases the expression of MOR while decreasing the expression of KOR receptors (8,9). The presence of conflicting results motivated us to investigate the effect of acute and chronic morphine consumption on the expression of the MOR opioid receptor gene in the spinal cord of male rats in both the presence and absence of carrageenan-induced inflammation. Various research have shown the effect of gonadotomy on opioid analgesics (10,11). The results of a group showed that testosterone plays an effective role in creating tolerance to the analgesic effects of morphine, so its removal reduced tolerance, while the removal of female sex hormones did not have much effect on tolerance (12).

Methods : Male rats (n=54) were randomly divided into 9 groups: a control group and a sham group (gonadectomized animals, GDX sham) that received normal saline as the vehicle. The carrageenan groups (lambda, 1.5%) had animals receive carrageenan into the plantar surface of their paws. The chronic morphine groups (CMF, CMR + CAR, and CMF + GDX) received intraperitoneal injections of chronic morphine. The acute morphine groups (AMF, AMR + CAR, and AMF + GDX) were treated with intraperitoneal injections of acute morphine (10

mg/kg of body weight). In the chronic morphine groups, morphine (10 mg/kg of body weight) was injected in double doses (8 AM and 8 PM) for 8 consecutive days. Inflammation was induced by carrageenan injection, followed by a single dose of 10 mg/kg morphine, and 6 hours later, the animals were sacrificed to collect their lumbar spinal cords

Results : Our results showed a significant difference in MOR gene expression among the different groups. Additionally, assessing the role of gonadectomy on MOR gene expression revealed that the CAR + AMOR + GDX and CAR + CMOR + GDX groups had lower KOR gene expression compared to the CAR group

Conclusion : Based on the present results, the occurrence of tolerance prevented the increase in gene expression caused by carrageenan and despite the inflammation, the expression level of MOR and KOR does not increase beyond control. Also, the presence of sex hormones reduces inflammatory responses by reducing the density of interleukin receptors.

Keywords : morphine, inflammatory, MOR gene.

Count: 270
Abstract ID: 15
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Evaluation of Trans Sodium Crocetinate (TSC) in a Rat Model of Focal Cerebral Ischemia-Reperfusion Injury: neurological function, histopathological changes, and oxidative stress analysis

Submission Author: Mahboobeh GhasemzadehRahbardar

Mahboobeh GhasemzadehRahbardar[1], Hossein Hosseinzadeh[2], Karim Naraki[3], Homa Fazeli Kakhki[4]

1. Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran
2. Department of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran
3. Department of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran
4. Department of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Oxidative stress plays a pivotal role in focal cerebral ischemia-reperfusion injuries. Trans-sodium crocetinate (TSC), derived from saffron, exhibits antioxidant and neuroprotective properties. Therefore, this study aimed to evaluate the effect of TSC in the middle cerebral artery occlusion (MCAO) model of ischemic stroke in rats.
Methods : Male Wistar rats underwent MCAO for 30 minutes, followed by a 24-hour reperfusion period. The study groups were as follows: 1. Sham (normal saline, 250 µl, i.p.), 2. MCAO (normal saline, 250 µl, i.p.), 3-5. MCAO+ TSC (25, 50, and 100 mg/kg, i.p.), 6. TSC (100 mg/kg, i.p.). After 24 hours, neurological function was assessed using the neurological Rogers scale. Moreover, histopathological changes (hematoxylin and eosin), and oxidative stress markers (catalase (CAT), glutathione (GSH), malondialdehyde (MDA), superoxide dismutase (SOD) activity) were assessed in the peri-infarct region.
Results : Compared with the sham group, MCAO resulted in decreased neurological function and increased Rogers' scores. It augmented MDA amounts and lowered GSH, SOD, and CAT levels in peri-infarct cerebral tissues. Moreover, MCAO altered the morphology of cortical neurons, disorganized their arrangement, and the number of degenerated cells with condensed eosinophilic cytoplasm and pyknotic nuclei was elevated. However, the administration of TSC reversed most of these alterations. The administration of TSC (100 mg/kg) alone showed no significant difference compared with the sham group.
Conclusion : In rats, a single administration of TSC demonstrated significant improvement in neurological deficits and reduced cortical cell loss. These effects were attributed to the attenuation of oxidative stress, finally protecting against cerebral ischemia-reperfusion injury.
Keywords : Antioxidants; Catalase; Crocus; Ischemic Stroke; Oxidative Stress; Infarction

Count: 271
Abstract ID: 299
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Impact of Silver Nanoparticle on Cerebral Ischemia and Memory in Male Rats

Submission Author: Seyedeh Farinaz Saeed

Seyedeh Farinaz Saeed [1], Mohammad Hossein Morowvat[2], Masoud Haghani[3], Mohammad Reza Namavar[4]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Pharmaceutical Sciences Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
3. Histomorphometry and Stereology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
4. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Stroke is the second leading cause of death worldwide. Many factors contributing to the incidence and severity of ischemic events have been reported. The background variables influence the cellular mechanisms of ischemia, which consequently affect the severity, symptoms, and treatment course of stroke. Along with the causes of blood clots and hypertension that were already determined, the new environmental exposure to the stable toxic compounds calls for further research on the influence of the new factors causing fluctuation in severity and symptoms, and modifying the recovery process and the efficacy of treatment regarding this disease. Metallic nanoparticles are produced in significantly larger quantities than a decade ago due to the wide range of industrial and energetic applications. Among all metal nanoparticles, silver nanoparticles (AgNP) have experienced a significant rise in their production and environmental presence; this includes the projected usage of 800 tons per year by 2025. Silver Nanoparticles are increasingly incorporated into consumer products, such as food packaging, cosmetics, and medical diagnostic procedures, which leads to significant daily exposure among the general population. Therefore, this research discusses the effects of silver nanoparticle exposure on cerebral ischemia in male rats.

Methods : Thirty male rats were randomly divided into five groups: 1) Control, 2) Stroke-MCAO (induced by occlusion of the middle cerebral artery), 3) MCAO+AgNP-oral administration of 1 mg/kg AgNP for 14 days in stroke-affected rats. Neurological examinations were performed on days 1, 3, 7, and 14 after brain ischemia induction. The behavioral test was conducted using a novel object test on days 11,12 and 13 of the experiment.

Results : In this study, animals received silver nanoparticles post-stroke had their ability to retain memories lower than the control group ($P<0.05$). The present study evidenced further that exposure to silver nanoparticles in post-stroke conditions delays recovery from stroke symptoms during acute and sub-acute phases compared to the control group.

Conclusion : Exposure to silver nanoparticles after brain ischemia may exacerbate memory dificency that occurred by ischemic stroke. This research suggests that minimizing silver nanoparticle exposure, especially through acute and subacute post-stroke phases, might help the recovery.

Keywords : Stroke, silver nanoparticles, hippocampus, memory

Count: 272
Abstract ID: 19
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Impact of Toll-like receptor 4 inhibitor agents on the size of infarction volume and neurological functions in rodent ischemic stroke models: a systematic review and meta-analysis

Submission Author: Mohammad Abbasalizadeh

Mohammad Abbasalizadeh[1]

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

Conclusion : The results suggest promising therapeutic strategies employing anti-TLR4 agents through diverse inhibitory pathways to alleviate cerebral ischemic injury in association with reperfusion therapy.

Keywords : Toll-like Receptor 4 (TLR4); Ischemic Reperfusion Injury (IRI); Anti-TLR4 agents; Cerebral ischemia; Middle Cerebral Artery Occlusion (MCAO)

Count: 273
Abstract ID: 84
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Daphnetin maintains blood-brain barrier integrity and enhances claudin-5 expression in a model of ischemic reperfusion injury.

Submission Author: MAYSAM HAVASI

MAYSAM HAVASI[1], Shahein Momenabadi[2], Ali Vakili[3], Abedin Vakili[4], Abbas Pakdel[5]

1. Research Center of Physiology, Semnan University of Medical Sciences, Iran
2. Research Center of Physiology, Semnan University of Medical Sciences, Iran
3. Research Center of Physiology, Semnan University of Medical Sciences, Iran
4. Research Center of Physiology, Semnan University of Medical Sciences, Iran
5. Department of Biochemistry, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran

Background and Aim : Cerebral ischemia can lead to the breakdown of the blood-brain barrier (BBB) through reduced levels of claudin-5 and other tight junction proteins. This damage to the BBB allows harmful substances to enter the brain, increasing the likelihood of brain injury. This study aimed to evaluate the effect of Daphnetin (DAP), a natural compound derived from coumarin, on BBB integrity, brain edema, and the expression of Claudin-5, a crucial protein in the tight junctions of endothelial cells, in an animal model of global brain ischemia

Methods : Global brain ischemia is induced in mice by temporarily occluding the bilateral common carotid arteries for 30 minutes, followed by a reperfusion period of 48 hours. DAP (40 mg/kg IP) was administered immediately after ischemia. To assess BBB integrity 60 minutes after ischemia, a 2% Evans Blue (E.B.) dye is injected via the tail vein. Forty-eight hours after reperfusion E.B. leakage as an indicator of BBB disruption, and brain water content as a marker of brain edema were measured. The expression of claudin-5 is evaluated using the immunofluorescence method

Results : EB leakage significantly increased after cerebral ischemia ($P<0.001$). The administration of DAP significantly decreased EB leakage compared to the ischemic group ($P<0.001$). Additionally, treatment with DAP significantly enhanced the claudin-5 expression and reduced the percentage of brain water content ($P<0.01$).

Conclusion : Our findings indicated that DAP preserved BBB function and reduced brain edema by increasing the levels of Claudin-5 in a rodent model of cerebral ischemia. However, further research was needed to elucidate its mechanisms and explore potential clinical applications

Keywords : : Daphnetin, Cerebral ischemia, BBB, Claudin-5, Brain edema, Mice

Count: 274
Abstract ID: 67
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Thymoquinone alleviated infarction volume and cerebral edema in animal model of ischemic stroke

Submission Author: Zohre Fendereski jaz

Zohre Fendereski jaz[1], Mohammadreza Bigdeli[2], Sepideh Khaksar*[3]

1. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
2. Department of Animal Sciences and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran.
3. Department of Plant Sciences, Faculty of Biological Sciences, Alzahra University, Tehran, Iran. * s.khaksar@alzahra.ac.ir

Background and Aim : Cerebral ischemia is the third leading cause of mortality and one of the most common causes of disability, imposing a significant social and economic burden. Experimental evidence suggests that ischemic damage is mainly caused by reactive oxidizing chemicals. Therefore, the use of compounds with antioxidant and anti-inflammatory properties could be an effective therapeutic option in ischemic stroke. Thymoquinone (TQ), the active ingredient of Nigella sativa, has attracked attention as a potential therapeutic strategy for treating inflammatory diseases and preventing oxidative cellular damage, particularly in the brain. The present study was designed to evaluate the effects of TQ on ischemic volume and cerebral edema.

Methods : The rats were divided randomly into three main groups. In the sham group, rats were only subjected to ischemic surgical stress without occluding the cerebral artery by filament. In the control group, the rats underwent 60 min of right middle cerebral artery occlusion (MCAO) surgery without receiving any treatment. In treatment group, the rats were subjected to ischemic surgery (MCAO). After removing the filament, thymoquinone was administered intraperitoneally to each mouse at a dose of 15 mg/kg. After 24 h, neurological deficit scores (NDS), infarct volume (IV), and brain edema in cortex, striatum, and piriform cortex-amygdala areas of rat brain were assessed.

Results : The present results indicated that NDS was increased in control group compared to sham group ($P<0.01$), while treatment group with TQ indicated a significant reduction in NDS of the sensory part in comparison with control group ($P<0.0001$). In addition, the striatal infarct volume of TQ group significantly attenuated compared to control group. Also, the statistical analysis between experimental groups showed that cerebral edema decreased in striatum area of TQ group in comparison with control group ($P>0.001$).

Conclusion : The results of the present study showed that TQ is an effective treatment to reduce brain damage, ischemic volume and brain edema. Additionally, it may be worthwhile to

examine the dosage and timing of TQ administration, as these factors can greatly influence therapeutic outcomes.

Keywords : Nigella sativa, Thymoquinone, Cerebral Ischemia, Infarction, Cerebral Edema.

Count: 275
Abstract ID: 58
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The effect of Opuntia Ficus Indica hybrid nanoparticles on the neurological defects of ischemic stroke in male Wistar rat

Submission Author: Zahra Sadeghian

Zahra Sadeghian[1], Mohammadreza Bigdeli[2], Mehdi Jahanfar[3], Fatemeh mortazavi moghadam[4]

1. Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
2. Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran. Institute for Cognitive and Brain Science, Shahid Beheshti University, Tehran, Iran
3. Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
4. Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran

Background and Aim : Background and purpose: According to the latest statistics obtained from the World Stroke Organization (WSO) in 2023, stroke is still the second cause of death and the third cause of global disability. The pathophysiology of stroke is complex, and oxidative stress is one of its most influential causes. So far, several studies have been performed in this field, each of which has played an effective role in improving this condition. Now, by designing a Nano hybrid delivery system, we created a more effective role in the process of ischemic recovery.

Methods : Materials and methods: In this study, middle cerebral artery occlusion (MCAO) was modeled in 75 male Wistar rats 250 grams, which were randomly divided into 5 groups (n=15): sham group (no ischemia induction), control (with induction of ischemia), first (with receiving essential oil rechingeri and induction of ischemia), second (receiving niosome containing essential oil and also induction of ischemia) and third treatment group (with inducing cerebral ischemia and receiving hybrid nanoparticle). In this study, rats were treated with a specific dose subcutaneously two hours before ischemia induction. Each of the groups is divided into 5 subgroups (n=3) and according to stroke volume, cerebral edema, blood-brain barrier permeability (Evans blue concentration), superoxide dismutase (SOD) enzyme concentration and The concentration and expression of miR-327. Also, in each subgroup, rat behavioral analyzes were evaluated.

Results : Results: The data obtained from this research showed that in the Opuntia Nano hybrid group, it reduced the total stroke volume ($P=0.002$), reduced brain edema in the cortex area significantly ($P<0.0001$), and improved the blood-brain barrier ($P\leq0.05$), the increase in the concentration of superoxide dismutase enzyme in all three areas of the cortex, striatum and piriform-amygdala had the same significant levels ($P<0.0001$) and the concentration of miR-327 in the Nano hybrid group with a significant level in the areas Cortex, striatum and piriform-amygdala respectively were compared to the essential oil rechingeri and niosome containe with

it groups (P=0.006, P=0.0001, P=0.007). Also, in the behavioral analysis of the rat, the improvement of motor and sensory reflexes was evident.

Conclusion : Conclusion: Therefore, it seems that the essential oil Satureja rechingeri, which is a species native to Iran, contains the effective substance carvacrol on the oxidative stress system, but in order to prevent peroxidation while crossing the blood-brain barrier, the niosome system was used, which can be a good option for to have its effect, and Opuntia Ficus Indica, a plant that is in the form of nanoparticles with a body of its powder properties according to FTIR analysis, with the ability to resist temperature, hydrophilic for faster effect, biocompatible, can have a synergistic effect on the healing of neurological defects. Also, according to DPPH analysis, it has high antioxidant properties and can exert a high protective effect against damage caused of ischemic stroke.

Keywords : ischemic stroke; Opuntia hybrid nanoparticle; niosome, oxidative stress; blood-brain barrier; essential oil rechingeri.

Count: 276
Abstract ID: 689
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Protective effects of calcitriol on cerebral ischemia/reperfusion injury rats by regulating oxidative stress-related Nrf2 pathway

Submission Author: Zeinab Vahidinia

Zeinab Vahidinia[1], Abolfazl Azami Tameh [2], Mohammad Taghi Joghataei[3]

1. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
2. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
3. Department of Anatomy, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Previous studies have shown that calcitriol exerts neuroprotective effects in ischemic stroke; however, its specific role and the underlying mechanisms in brain injury due to ischemia remain poorly understood. This study aimed to evaluate the neuroprotective effects of calcitriol pretreatment and explore the potential involvement of the nuclear factor erythroid 2-related factor 2 (Nrf2) signaling pathway in mitigating brain ischemia/reperfusion (I/R) injury in a rat model

Methods : An ischemia/reperfusion (I/R) model was induced in male Wistar rats, involving 1 hour of ischemia followed by 23 hours of reperfusion. Calcitriol was administered intraperitoneally for 7 consecutive days prior to the induction of stroke. Neurobehavioral deficits and infarct volume were assessed 24 hours post-ischemia induction. Oxidative stress markers, including malondialdehyde (MDA), nitric oxide (NO), and total antioxidant capacity (TAC), were measured. Protein and mRNA expression levels of HO-1 and Nrf2 were analyzed using western blotting and reverse transcription polymerase chain reaction

Results : The results revealed that calcitriol significantly reduced infarct volume and improved neurological function following I/R injury. Calcitriol pretreatment led to a marked reduction in MDA and NO levels, along with a substantial increase in TAC levels. Furthermore, calcitriol upregulated the expression of HO-1 and Nrf2 at both the protein and mRNA levels in the ischemic brain.

Conclusion : These findings suggest that calcitriol confers neuroprotection against I/R-induced brain injury, likely through the inhibition of oxidative stress and activation of the Nrf2/HO-1 signaling pathway.

Keywords : Ischemic stroke, Calcitriol, Nrf2, Oxidative stress

Count: 277
Abstract ID: 440
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Sodium butyrate improve motor function through regulating the stress oxidative and proteolytic factors in the striatum following ischemic stroke in the male rats

Submission Author: Nasim Naseri

Nasim Naseri[1], Mohammad Reza Bigdeli[2], Fatemeh Mortazavi Moghadam[3], Bahram Kazemi[4]

1. Department of Animal Science and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
2. Department of Animal Science and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
3. Department of Animal Science and Marine Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran
4. Cellular and Molecular Biology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Oxidative stress and blood-brain barrier (BBB) disruption are two major consequences of ischemic stroke, accompanied by decreased activity levels of antioxidant enzymes such as glutathione peroxidase (GPx) and increased neurodegenerative factors like matrix metalloproteinase-9 (MMP9). Recent research has highlighted the impact of gut microbiome metabolites, as part of the gut-brain axis, on brain physiology, particularly through their anti-inflammatory effects. This study evaluated the effects of sodium butyrate (SB), a key gut microbiome metabolite, on ischemia/reperfusion (I/R) outcomes in the striatum.

Methods : Male Wistar rats, weighing 200-250g, randomly were divided into 3 main groups including sham, MCAO, and SB groups (n=5/each group). The SB group was pretreated with SB (1200 mg/kg, i.p.) at 24 and 4 hours before ischemic insult. The animals in the MCAO and SB groups then underwent 1 hour of middle cerebral artery occlusion (MCAO). Twenty-four hours after reperfusion, the motor function was assessed by testing the limbs and head condition when raising the rats by the tail and also monitoring their walk when they were placed on the floor. Then, the brain striatum was dissected to measure GPx enzyme activity. Additionally, MMP9 mRNA levels were quantified using real-time PCR.

Results : The results showed a significant increase in neurological deficit scores related to motor function in the MCAO group, indicating neurological impairment. I/R caused a marked decrease in GPx activity and a substantial increase in MMP9 mRNA levels in the striatum. However, SB pretreatment improved behavioral function and enhanced GPx activity. Furthermore, MMP9 mRNA levels significantly decreased in the SB-treated group.

Conclusion : These findings suggest that SB exhibits neuroprotective effects against I/R by upregulating GPx activity in the striatum, thereby confirming its anti-inflammatory properties. Additionally, SB inhibited MMP9 gene expression. Since MMP9 is a key contributor to BBB degradation through its proteolytic activity, this suggests that SB helps maintain BBB integrity by suppressing MMP9 expression. The improved neurological deficit scores in motor function further validate the efficacy of SB in protecting the striatum, a critical brain region for motor function regulation.

Keywords : ischemic stroke; sodium butyrate; GPx; MMP9; motor function

Count: 278
Abstract ID: 636
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The Protective Role of Capparis spinosa Extract Against Focal Cerebral Ischemia-Reperfusion Injury in Rats

Submission Author: Ali Mostafavi nezhad

Ali Mostafavi nezhad[1], Hassan Rakhshandeh[2], Mohammad Bagher Khorrami[3], Fatemeh Forouzanfar[4]

1. Department of Neuroscience, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Social Security Organization, 17th Shahrivar Hospital, Mashhad, Iran.
4. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.

Background and Aim : Ischemic stroke is a serious public health concern. Despite significant research efforts in this area, little is known about novel treatments.

Methods : Wistar rats underwent 30-min MCAO-induced brain ischemia followed by 24 h of reperfusion. C. spinose was administrated orally once a day for 7 days before the induction of MCAO. The neurologic outcome, infarct volume (TTC staining), histological examination, and markers of oxidative stress, including total thiol content, and malondialdehyde (MDA) levels, were measured 24hr. after the termination of MCAO.

Results : Pretreatment with C. spinosa resulted in a decrease in neurological deficit scores, a reduction in histopathological alterations, and a smaller infarct volume in the treated groups compared to the stroke group. Furthermore, pretreatment with C. spinosa extract significantly reduced the level of MDA with concomitant increases in the levels of thiol in the brain tissues compared to the stroke group.

Conclusion : Our study demonstrates that C. spinosa extract effectively protects MCAO injury through the attenuation or the suppression of the oxidative stress.

Keywords : Capparis spinosa; flavonoid; ischemic stroke; neuroprotection; oxidative stress; transient focal ischemia

Count: 279
Abstract ID: 330
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Association between dietary total antioxidant capacity and the risk of stroke: a nested case-control study

Submission Author: Adrina Habibzadeh

Adrina Habibzadeh[1], Reza Tabrizi[2], Mehran Rahimlou[3], Mahdi Ravankhah[4], Farhad Vahid[5]

1. Student Research Committee, Fasa University of Medical Sciences, Fasa, Iran
2. Noncommunicable Diseases Research Center, Fasa University of Medical Science, Fasa, Iran
3. Department of Nutrition, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran
4. School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
5. Nutrition & Health Research Group, Department of Precision Health, Luxembourg Institute of Health, Strassen, Luxembourg

Background and Aim : Oxidative stress after ischemic stroke contribute to neuronal cell injury. Unhealthy and unbalanced dietary patterns can increase the risk of several diseases, including stroke and cardiometabolic ones. However, the association between dietary total antioxidant capacity (DTAC) of antioxidant and stroke is controversial. Our study aimed to establish a correlation between DTAC and its impact on the occurrence of stroke.

Methods : This nested case–control study included 79 stroke cases and 158 healthy controls. We used data from the Fasa Adults Cohort Study (FACS) comprising 10,035 individuals at baseline. To assess the nutritional status of each individual, a 125-item food frequency questionnaire (FFQ) has been used to evaluate their dietary habits and intakes over the past year. DTAC was calculated using the ferric-reducing antioxidant power (FRAP) international databases. The stroke was confirmed by an experienced neurologist using standard imaging methods. Conditional logistic regression analyses were performed to evaluate the association between DTAC and stroke.

Results : The assessment of DTAC revealed that there was no statistically significant distinction between cases (mean ± SD: 5.31 ± 2.65) and controls (5.16 ± 2.80) with a p-value of 0.95. Even after adjusting for the potentially important confounding factors such as age, sex, event time, energy intake, smoking, hypertension, and diabetes, the association remains non-significant (adjusted odds ratio (OR) = 1.06, 95% CI: 0.94, 1.20, p-value = 0.33).

Conclusion : Our results did not confirm a significant link between DTAC and stroke risk. These findings emphasize the intricate interplay of factors influencing stroke risk and highlight the need for further research to unravel these relationships more comprehensively.

Keywords : dietary total antioxidant capacity; stroke; Oxidative stress

Count: 280
Abstract ID: 2
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Investigating the effect of isorhamentin on testis fertility markers in rat cerebral ischemia model

Submission Author: Ali Dehghaninejad

Ali Dehghaninejad[1], Fatemeh Sabbaghziarani[2], Reza Kiani[3], Nasim Khanahmadi[4], Hootan Shahdost[5]

1. Qazvin University of Medical Sciences Department of Cell biology and Anatomical Science Qazvin, Iran
2. Qazvin University of Medical Sciences Department of Cell biology and Anatomical Science Qazvin, IranRe
3. Faculty of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd,Iran
4. Qazvin University of Medical Sciences،Department of Parasitology
5. Qazvin University of Medical Sciences Department of Cell biology and Anatomical Science Qazvin, IranRe

Background and Aim : Ischemia is the most common type of stroke, which usually occurs due to middle cerebral artery occlusion (MCAO) and ultimately leads to destructive brain damage. Inflammation is considered as one of the main mechanisms in the pathogenesis of cerebral ischemia

Methods : 30 Wistar rats were randomly divided into three groups: sham, ischemia, and ischemia + treatment. In the ischemia groups, the middle cerebral artery was closed on the left side. In the ischemia + treatment group, isoramantin (5 mg per kg of body weight) was injected intraperitoneally at 24, 72, and 120 hours after ischemia surgery. Neurobehavioral tests were performed in all groups on the sixth day after surgery, and after anesthesia and blood samples, the brain and testicles of the animals were removed. Then, triphenyl tetrazolium chloride (TTC) staining to evaluate stroke volume, real-time PCR (Reverse transcription quantitative polymerase chain reaction: RT-qPCR) to evaluate inflammatory factors IL-1β (Interleukin-1β) and IL-6 (Interleukin 6) in the brain, as well as PRM1 and PRM2 (Protamine 1 & 2) markers in the testis and ELISA (Enzyme-linked immunosorbent assay: ELISA) were performed to check the level of LH and FSH hormones in the serum.

Results : In the ischemia group + treatment with isorhamentin, an increase in neurobehavioral test scores and a decrease in stroke volume were observed compared to the ischemia group. . In the RT-qPCR studies, the expression levels of IL-1β and IL-6 genes in the brain decreased and the expression levels of PRM1 and PRM2 genes in the testis tissue increased significantly compared to the ischemia group. In the ELISA studies, the levels of LH and FSH hormones in the ischemia group + treatment with isorhamentin increased significantly compared to the ischemia group ($p \leq 0.05$)

Conclusion : Based on the results of the present study, it seems that isorhamentin can improve the spermatogenesis process by increasing the expression of testicular fertility markers by modulating the inflammatory factors and reducing stroke volume, and then removing the disturbance in the hypothalamus-pituitary-gonadal pathway

Keywords : middle cerebral artery occlusion, cerebral ischemia, inflammatory factors, isoramantin, testicular fertility markers

Count: 281
Abstract ID: 109
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Molecular mechanisms of Daphnetin neuroprotective effects in brain ischemia: Focusing on BDNF, SOD, IL-1β, and NF-κB

Submission Author: Shahein Momenabadi

Shahein Momenabadi[1], Maysam Havasi Mehr [2], Ali Vakili[3], Abedin Vakili [4]

1. Research Center of Physiology, Semnan University of Medical Sciences, Iran
2. Research Center of Physiology, Semnan University of Medical Sciences, Iran
3. Research Center of Physiology, Semnan University of Medical Sciences, Iran
4. Research Center of Physiology, Semnan University of Medical Sciences, Iran

Background and Aim : Our previous study demonstrated that Daphnetin (DAP), a natural compound derived from coumarin, protects hippocampal neurons from ischemic reperfusion injury in a rodent stroke model. However, the precise molecular mechanisms underlying DAP's neuroprotective effects in ischemic brain injury remain unclear. This study aimed to investigate the molecular mechanisms involved in DAP neuroprotection in an animal model of global cerebral ischemia.

Methods : Global cerebral ischemia was induced in male Swiss albino mice through 30 minutes of bilateral common carotid artery occlusion (BCCAO), followed by 48 hours of reperfusion. DAP at an optimal dose of 40 mg/kg IP was given immediately after BCCAO. After 48 hours of reperfusion, BDNF expression was assessed using immunofluorescence, while the expression levels of SOD, interleukin-1 beta (IL-1β), and NF-κB were analyzed by Western blotting.

Results : The BDNF expression was significantly increased with DAP treatment compared to the control group ($P<0.001$). Western blot analysis demonstrated DAP significantly reduced NF-κB and IL-1ß levels, as well as enhanced the SOD expression 48 hours post-ischemia-reperfusion in the brain tissue ($P<0.001$).

Conclusion : Our findings suggest that the protective effects of DAP on hippocampal neurons following ischemic injury may be mediated by the suppression of inflammatory pathways, along with the enhancement of antioxidant enzymes and neurotrophic factors like BDNF.

Keywords : Daphnetin, Cerebral ischemia, BDNF, SOD, NF-κB and IL-1ß, Mice

Count: 282
Abstract ID: 74
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Impact various doses of Daphnetin on hippocampal neuronal injury and spatial memory performance in a mouse model of global cerebral ischemia

Submission Author: Ali Vakili

Ali Vakili[1], Maysam Havasi Mehr[2], Shahein Momenabadi[3], Abbas Ali Vafaei[4], Abedin Vakili [5]

1. Research Center of Physiology, Semnan University of Medical Sciences, Iran
2. Research Center of Physiology, Semnan University of Medical Sciences, Iran
3. Research Center of Physiology, Semnan University of Medical Sciences, Iran
4. Research Center of Physiology, Semnan University of Medical Sciences, Iran
5. Research Center of Physiology, Semnan University of Medical Sciences, Iran

Background and Aim : The aim of this study was to evaluate the impact of different doses of Daphnetin (DAP, a natural compound derived from coumarin) on hippocampus neuronal injury, spatial memory and neurological functions in a mouse model of cerebral ischemia.

Methods : Cerebral ischemia was induced in mice through bilateral common carotid artery occlusion (BCCAO) for 30 minutes, followed by 48 hours of reperfusion. DAP was administered immediately after the BCCAO at doses of 5, 10, 20, 40, 80, and 160 mg/kg via intraperitoneal injection. The survival of hippocampal neurons was evaluated using Cresyl violet staining. Spatial memory was assessed using the Radial Arm Water Maze task, and neurological functions were scored using a system ranging from 0 to 14 points, 48 hours after the ischemic/reperfusion event.

Results : Administering DAP significantly increased the percentage of surviving neurons in the hippocampus's CA1, CA3, and DG regions as dose-dependently ($P<0.001$). DAP only at dose 40 mg/kg reduced the spatial memory and neurological dysfunction ($P<0.01$).

Conclusion : Our study revealed that DAP promoted the survival of neurons in the CA1, CA3, and DG areas of the hippocampus and reduced spatial memory loss and neurological dysfunction in a dose-dependent manner after cerebral ischemia in mice. Further research is required to clarify the mechanisms and possible clinical uses.

Keywords : Daphnetin, Cerebral ischemia, Hippocampus, Spatial memory, Mice

Count: 283
Abstract ID: 342
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Evaluation of Cell Survival in Hypoxic Preconditioned Astrocytes Following Oxidative Stress Induced by Hydrogen Peroxide

Submission Author: Zahra Jamali

Zahra Jamali[1], Mohammad Ghasemian[2], Mehdi Dianatpour[3], Sareh Pandamooz[4], Mohammad Saied Salehi[5]

1. Department of Medical Genetics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Medical Genetics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
3. Department of Medical Genetics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
4. Stem Cells Technology, Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
5. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Astrocytes are essential for maintaining neuronal survival and brain homeostasis, particularly under oxidative stress, which plays a critical role in ischemic stroke pathology. Hypoxic preconditioning (HP) has been proposed as a strategy to enhance astrocyte resistance to oxidative damage, potentially improving neuroprotection in stroke.

Methods : Primary astrocytes were subjected to varying durations of hypoxic preconditioning, followed by either reoxygenation or direct exposure to oxidative stress induced by H_2O_2. Cell viability was measured using the MTT assay.

Results : Astrocytes preconditioned with hypoxia demonstrated significantly increased viability when exposed to H_2O_2-induced oxidative stress, compared to non-preconditioned controls. Reoxygenation following HP further enhanced astrocyte resilience.

Conclusion : Hypoxic preconditioning, especially when followed by reoxygenation, substantially improves astrocyte resistance to oxidative stress, suggesting potential benefits for ischemic stroke therapy. These findings support HP as a promising strategy for enhancing astrocyte function and neuroprotection, paving the way for future therapeutic approaches in stroke management.

Keywords : Ischemic stroke; Astrocytes; Hypoxia preconditioning; Oxidative stress

Count: 284
Abstract ID: 423
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Complete inhibition of phosphatase and tensin homolog promotes the normal and oxygen-glucose deprivation/reperfusion-injured PC12 cells to cell death

Submission Author: Sohrab Minaei beirami

Sohrab Minaei beirami[1], Mohammad Hasan Khadem Ansari[2], Yousef Rasmi[3], Nader Shakib[4], Pouran Karimi[5]

1. 1 Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran 2 Department of Biochemistry and Clinical Laboratories, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Biochemistry, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran
3. Department of Biochemistry, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran
4. Department of Biochemistry, Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran
5. Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Lipid phosphatase and tensin homolog deleted from chromosome 10 (PTEN) antagonizes phosphoinositide 3-kinase (PI3K)/AKT cell survival pathway. The effect of PTEN inhibitors has been rarely examined on cell survival following reperfusion injury. In this study, we investigated the neuroprotective effect of SF1670, as a new PTEN inhibitor, on an in vitro stroke-like model.

Methods : PC12 cells were exposed to oxygen-glucose deprivation/reperfusion (OGD/R). The cells were treated in five conditions as follows: normoxic normoglycemic (NO/NG); 60 minutes OGD; 60 minutes OGD and 6 h reperfusion (OGD/R); OGD/R treated with 10 µM SF1670 (OGD/RSF), and NO/NG treated with 10 µM SF1670 (NO/NG-SF). Then, phosphorylation levels of AKT, P38 in PC12 cells were measured by immunoblotting. The cell viability was also determined by colorimetric assay.

Results : The results of immunoblotting revealed that following OGD/R the levels of phosphoAKT (p-AKT) significantly decreased, compared to NO/NG cells ($P < 0.05$). However, the ratio of p-AKT/total AKT significantly increased in the presence of SF1670 in the OGD/R-SF group, compared to the OGD/R condition. On the other hand, SF1670 significantly reduced the p-P38 MAPK and p-JNK levels, compared to OGD/R cells. Moreover, cell viability significantly decreased in the OGD and OGD/R condition compared to NO/NG cells. Surprisingly, SF-treated cells (OGD/R-SF and NO/NG-SF group) showed low cell viability compared to NO/NG condition.

Conclusion : Overall, our results demonstrated that complete inhibition of phosphatase activity of PTEN not only did not exhibit neuroprotective effect but also promoted PC12-deprived cells to death.

Keywords : OGD; Reperfusion Injury; AKT; p38; MAPK; PC12 Cells

Count: 285
Abstract ID: 314
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

The protective effect of cuminaldehyde-loaded nanoniosome on post-stroke cognitive impairment

Submission Author: Seyedeh tahereh Alavi

Seyedeh tahereh Alavi[1], Akbar Hajizadeh Moghaddam[2], Sedigheh khanjani jelodar[3], Somaye Rahaee[4]

1. Department of Animal Sciences, Faculty of Basic Sciences, University of Mazandaran, Babolsar, Iran.
2. Department of Animal Sciences, Faculty of Basic Sciences, University of Mazandaran, Babolsar, Iran.
3. Department of Animal Sciences, Faculty of Basic Sciences, University of Mazandaran, Babolsar, Iran.
4. Faculty of Biotechnology, Amol University of Special Modern Technologies, Amol, Iran

Background and Aim : Cerebral ischemia, which is characterized by a decrease in blood flow to the brain, often leads to cognitive disorders, including memory deficits and impaired executive function and learning. Post-stroke cognitive impairment (PSCI) severely affects the ability to live independently in one third of patients and it is likely to become dementia. Therefore, PSCI, including memory and learning disorders, has become one of the primary challenges in stroke rehabilitation. Cuminaldehyde or 4 isopropyl benzaldehyde (C10H12O) is the main component of cumin seed essential oil, which is one of the most popular spices in the world due to its medicinal and therapeutic properties. Cuminaldehyde's various medicinal functions include antimicrobial, antifungal, antioxidant, and anti-Inflammatory. Despite these functional properties, the bioavailability and medicinal effects of cumin aldehyde are limited due to its high volatility, low solubility in water and its sensitivity to oxygen and moderate temperatures, so to overcome these shortcomings, niosomes are used as lipid-based nanocarriers to increase stability against unfavorable conditions and facilitating its passage through the blood-brain barrier. Therefore, in the present study, the effects of cuminaldehyde-loaded nanonisomes on the indicators of learning disorder in the cerebral ischemia model of rats.

Methods : In this study, 48 male Wistar rats were placed in 4 group of control, I/R, cumin and nano-cumin. Cuminaldehyde (20 mg/kg) was orally administered to rats for 14 days. Then on the 15th day, all groups except the control group underwent I/R surgery. 24 hours after the induction of I/R, all the rats were subjected to the novel object recognition test to investigate learning disorders

Results : Our results showed that the discrimination index in the new object recognition test in the cerebral ischemia model, it showed a significant decrease ($P<0.01$) in the I/R group compared to the control group. On the other hand, this index has shown a significant increase in the cuminaldehyde nanonisome group compared to the I/R group. ($P<0.001$) However, there was no significant difference in the nanoniosome group with the control group.

Conclusion : In general, these findings show that pretreatment with cuminaldehyde nano nisome improves the symptoms of learning disorders caused by stroke, so cuminaldehyde can be mentioned as a promising candidate for adjunctive treatments in the management of learning disorders in ischemic brain diseases.

Keywords : cerebral ischemia; cognitive impairment; nanoniosme; cuminaldehyde

Count: 286
Abstract ID: 500
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Investigation of the Role of Calcitriol in Improving Ischemic Injury and Expression of FGFR2 Gene in an Ischemic Stroke Model in Rats

Submission Author: Fahime Ramshini

Fahime Ramshini[1], Hassan Hassani Baferani[2], Javad Amini Mahabadi[3], Zeinab Vahidinia[4]

1. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran
2. Gametogenesis research center, Kashan University of Medical Sciences, Kashan, Iran
3. Gametogenesis research center, Kashan University of Medical Sciences, Kashan, Iran
4. Anatomical Sciences Research Center, Institute for Basic Sciences, Kashan University of Medical Sciences, Kashan, Iran

Background and Aim : Ischemic stroke, accounting for the majority of stroke cases, typically occurs in the middle cerebral artery (MCA), which is responsible for supplying blood to the brain hemisphere. Obstruction in this artery leads to reduced blood flow and brain damage. Following ischemic injury, inflammatory molecules are released from damaged cells, triggering local inflammation and exacerbating the ischemic condition. Despite significant efforts and investments, an effective drug has yet to be developed. Given the neuroprotective, anti-inflammatory, and regenerative properties of vitamin D3, this compound may be a suitable candidate for faster recovery of neurological functions in post-stroke patients. Evidence has shown that fibroblast growth factor signaling and tyrosine kinase receptors (FGF/FGFR) play key roles in the development, homeostasis, and repair of various tissues and organs. Their abnormal expression or activity is associated with a wide range of diseases and disorders. Given the important role of FGFR2 in regulating oxidative stress and inflammation in various diseases, its role in ischemic stroke remains unknown. Therefore, this study investigates the effect of calcitriol on reducing inflammation, focusing on the role of FGFR2 in an ischemic stroke model in rats.

Methods : Ischemic stroke was induced using the MCAO method for one hour, followed by reperfusion. The effect of calcitriol was assessed 72 hours after the induction of the MCAO model. Calcitriol was administered intraperitoneally at a dose of 1 µg/kg in three doses after the ischemia model (30 minutes, 24 hours, and 48 hours post-induction). After 72 hours, the infarct volume and neurological damage were evaluated using TTC staining and the Garcia behavioral test. The expression of the FGFR2 gene at the mRNA level in the penumbra region of the brain cortex was analyzed using RT-PCR.

Results : The findings of this study showed that treatment with calcitriol significantly reduced the volume of the infarct area and markedly improved the neurological deficits in the animals. Furthermore, data analysis indicated an increase in FGFR2 gene expression in the stroke-

induced group compared to the sham group, while the expression of this gene in the calcitriol-treated group significantly decreased over the 72-hour period.

Conclusion : Based on the obtained data, it can be concluded that treatment with calcitriol at a dose of 1 µg/kg for 72 hours after ischemic/reperfusion brain injury in rats exerts therapeutic effects. These neuroprotective effects may be at least partially mediated through reducing inflammation via FGFR2 signaling.

Keywords : Stroke - Calcitriol - MCAO – FGFR2

Count: 287
Abstract ID: 564
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Poster

Stem Cell Therapies for Ischemic Stroke: Promising Strategies for Neurovascular Repair

Submission Author: Morteza Abdi

Morteza Abdi[1]

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

Conclusion : Ischemic stroke, characterized by the interruption of blood flow to the brain, leads to significant neuronal loss and functional impairment. Traditional therapeutic approaches, such as thrombolysis and mechanical thrombectomy, often have limited efficacy, particularly in the context of extensive neuronal damage. In recent years, stem cell therapies have emerged as a promising avenue for neurovascular repair and functional recovery following ischemic stroke. Stem cells possess the unique ability to differentiate into various cell types, including neurons, astrocytes, and endothelial cells, which are essential for the regeneration of damaged neural tissue. Several types of stem cells have been investigated for their potential to promote recovery after ischemic stroke, including mesenchymal stem cells (MSCs), neural stem cells (NSCs), and induced pluripotent stem cells (iPSCs). These stem cells can modulate inflammatory responses, promote angiogenesis, and enhance neuronal survival, thereby mitigating the detrimental effects of ischemic injury. Experimental studies have demonstrated that stem cell transplantation can improve functional outcomes in animal models of ischemic stroke. Mechanistically, stem cells exert their effects through a variety of pathways, including the release of neurotrophic factors, which support neuronal growth and survival, and the promotion of endogenous repair mechanisms. Furthermore, stem cells can also facilitate the formation of new blood vessels, a critical aspect of neurovascular repair. Clinical trials exploring the safety and efficacy of stem cell therapies for ischemic stroke are currently underway. Early results indicate that these therapies are generally well tolerated and may provide meaningful improvements in neurological function and quality of life. However, challenges remain, including optimal cell source selection, delivery methods, and timing of administration. In conclusion, stem cell therapies represent a promising strategy for neurovascular repair following ischemic stroke. Continued research is essential to fully understand the mechanisms underlying their therapeutic effects and to develop standardized protocols for clinical application. With ongoing advancements, stem cell therapies may pave the way for innovative treatments that improve outcomes for patients affected by ischemic stroke.

Keywords : Stem Cell Therapy, Ischemic Stroke, Neurovascular Repair, Regenerative Medicine

Count: 288
Abstract ID: 653
subject: Neural Injuries and Neurodegenerative Disorders: Ischemia, Stroke, and Neurovascular Disorders
Presentation Type: Oral

Gallic acid-loaded carrageenan effects on depressive like behaviors in animal model of cerebral ischemia/reperfusion

Submission Author: Parisa JahaniBahnamiri

Parisa JahaniBahnamiri[1], Akbar Hajizadeh Moghaddam[2], Sedigheh Khanjani Jelodar[3]

1. Department of Biology, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
2. Department of Biology, Faculty of Sciences, University of Mazandaran, Babolsar, Iran
3. Department of Biology, Faculty of Sciences, University of Mazandaran, Babolsar, Iran

Background and Aim : Cerebral ischemia has been considered a cerebrovascular disease that is caused by blood supply disruption to the brain and survivors suffer from behavioral disorders like depression. However, reperfusion following ischemia generates an excessive amount of free radicals, resulting in redox imbalance. Gallic acid (GA) is a phenolic acid highlighted for its antioxidant properties. Nonetheless, the pharmacokinetic profile of GA like low bioavailability limits its pharmacological application. Today, natural polysaccharides are used in polymeric Nano to improve drug bioavailability. Carrageenan (CG) is a natural polysaccharide extracting red algae used extensively in the food industry and pharmaceutical field due to its biodegradability, and biocompatibility. Also, CG through ionic interactions improves drug loading and bioavailability. This study aimed to investigate the effects of GA-loaded CG (GA-CG) on depressive-like behaviors and antioxidant defense in rat models of cerebral I/R.
Methods : 40 rats were divided into 4 groups: the control, I/R, and 2 pretreatment groups. The I/R group was subjected to I/R surgery. Pretreatment groups received GA and GA-CG at a dose of 40mg/kg orally for 2 weeks and then I/R surgery was induced. Eventually, animals were evaluated in terms of depressive-like behaviors using the tail suspension test (TST) and the GSH level was essayed in cortex area.
Results : I/R group significantly increased immobility time in TST compared to the control group ($p<0.001$). By contrast, pretreatment GA-CG declined the immobility time in comparison to theI/R group ($p<0.001$). Additionally, a significant differences was observed between GA-CG and GA groups ($p<0.05$). Also, the biochemical data has shown the GSH content was decreased in I/R group compared to the control group ($p<0.01$). Whereas. Pretreatment with GA-CG could increase GSH level compared to the I/R group ($p<0.05$).
Conclusion : Our findings suggested that GA-CG improved depressive-like behaviors and increased the GSH content in cortex tissue which is probably attributed to increased bioavailability and antioxidant activity of GA.
Keywords : Ischemia and Reperfusion, Oxidative stress, Gallic acid, Carrageenan, Polymeric nanocarrier, Rat

Count: 289
Abstract ID: 603
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: Mohammad Amin Forqani

Mohammad Amin Forqani[1], Farzaneh Vafaee[2]

1. Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Neuroscience Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background and Aim : Stroke is a highly prevalent and devastating condition affecting millions worldwide. The Devil's Claw (DCW) plant is a native African plant whose anti-inflammatory, antioxidant, and neuroprotective properties have been investigated. We postulated that DCW could protect the brain injury caused by cerebral ischemia.

Methods : The rats were randomly divided into four groups. The sham and control (Ctrl) groups received pretreatment with a distilled water vehicle. Doses of 200 and 400 mg/kg were selected for pretreatment with DCW. The filament or intravascular occlusion method was used for middle cerebral artery occlusion (MCAO). The Triphenyl tetrazolium chloride (TTC) staining method was used to investigate the infarct zone and penumbra volume. The neuroprotective effect of DCW was measured by hematoxylin staining. Movement performance was evaluated from neurological deficit score, rotarod performance, and open field tests.

Results : TTC staining showed that the DCW/400 group could maintain the penumbra's structure and reduce the infarct volume compared to the Ctrl group ($p<0.001$). Histological studies confirmed the neuroprotective properties of DCW at doses of 200 and 400 mg/kg compared to the Ctrl group ($p<0.01$ and $p<0.0001$, respectively). The results of behavioral tests showed an improvement in behavioral performance in pretreatment 400 mg/kg doses compare to Ctrl group ($p<0.0001$).

Conclusion : The study showed that pretreatment with DCW with its neuron protection potential reduces the infarct area and restores motor function after MCAO.

Keywords : Cerebral ischemia Devil's Claw Locomotor activity Neuronal density

Count: 290
Abstract ID: 744
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Cerebellar Morphometry in Multiple Sclerosis and Neuromyelitis Optica Spectrum Disorder: A Comparative MRI Study Using Deep Learning Analysis

Submission Author: Fouad MerajiFar

Fouad MerajiFar[1], Masoud Etemadifar[2], Nassim Jalilvand[3], Mohammadali Atlasi[4], Hamidreza Talari[5]

1. Alzahra Research Institute, Alzahra University Hospital, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Neurosurgery, Isfahan Medical University, Isfahan, Iran
3. Department of Electrical and Computer Engineering, Faculty of Engineering, Kharazmi University, Tehran, Iran
4. Anatomical Sciences Research Center, Kashan University of Medical Sciences, Kashan, Iran
5. Department of Radiology, Kashan University of Medical Sciences, Kashan, Iran

Background and Aim : : This study aimed to compare cerebellar morphometry in MS and NMOSD patients, assess the impact of aquaporin-4 antibody (AQP4-Ab) seropositivity on cerebellar volume in NMOSD patients, and explore correlations between cerebellar atrophy and clinical parameters, such as disease duration and disability.
Methods : : 106 patients (53 with MS and 53 with NMOSD) were included in this retrospective analysis. High-resolution 3D T1-weighted magnetic resonance imaging (MRI) was used to acquire brain images, and deep learning-based segmentation software was applied to measure the volumes of cerebellar subregions. Statistical analyses were conducted to compare cerebellar volumes between groups, and correlations with clinical parameters were evaluated.
Results : : Significant differences in cerebellar morphometry were observed between MS and NMOSD patients. NMOSD patients, particularly those who were AQP4-Ab seropositive, demonstrated more significant atrophy in specific cerebellar lobules, including the right V, right Crus I, left VIIIa, and vermis IX. MS patients showed a more diffuse pattern of cerebellar involvement, with a correlation between disease duration and atrophy in several lobules. The two groups had no significant differences in cerebellar white matter volumes.
Conclusion : This study reveals distinct patterns of cerebellar atrophy in MS and NMOSD, with NMOSD patients exhibiting more focal atrophy, particularly in AQP4-Ab-positive cases. These findings suggest that deep learning-based morphometry can provide valuable insights into the differential involvement of the cerebellum in these disorders, offering potential biomarkers for disease progression and aiding in early diagnosis. Future studies should focus on longitudinal assessments to further explore the clinical implications of cerebellar atrophy in MS and NMOSD.
Keywords : Multiple Sclerosis, Neuromyelitis Optica Spectrum Disorder, MRI, Cerebellum, AQP4-antibody

Count: 291
Abstract ID: 553
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Effect of Combined Kaempferol and Bone Marrow Mesenchymal Stem Cell-Derived Exosomes on Myelin Repair in the Corpus Callosum of a Cuprizone-Induced Demyelination Model

Submission Author: Fatemeh Rabiei

Fatemeh Rabiei[1], Maryam Ghasemi-Kasman[2]

1. Student Research Committee, Babol University of Medical Sciences, Babol 47176-47745, Iran.
2. Department of Physiology, School of Medicine, Babol University of Medical Sciences, Babol 47176-47745, Iran.

Background and Aim : Demyelination is a hallmark of various neurodegenerative disorders, such as multiple sclerosis, where the breakdown of myelin impairs neuronal function. Kaempferol, a flavonoid known for its antioxidant properties, and exosomes derived from bone marrow mesenchymal stem cells (BMSCs) have both demonstrated neuroprotective effects in preclinical studies. This study investigates the effect of the simultaneous administration of kaempferol and BMSC-derived exosomes on myelin repair in a cuprizone-induced demyelination model in mice.

Methods : A total of 60 male C57 mice were divided into five experimental groups: healthy control, cuprizone-induced demyelination with PBS administration, cuprizone with exosome administration, cuprizone with kaempferol administration, and cuprizone with combined kaempferol and exosome administration. Cuprizone was administered at 0.2% (w/w) in the diet for 8 weeks to induce demyelination. BMSC-derived exosomes were extracted from Wistar rats and characterized using transmission electron microscopy (TEM), dynamic light scattering (DLS), and Bradford assays. Following the demyelination period, the exosomes were administered intranasally, while kaempferol was injected into the cerebral ventricles. Behavioral assessment was performed using the Y-maze and novel arm discrimination test (NADT) to evaluate spatial memory and cognitive function. Additionally, biochemical assays, including total antioxidant capacity (TAC), malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx) activity, were conducted to assess oxidative stress and antioxidant defenses.

Results : The combined treatment of kaempferol and exosomes significantly improved spatial memory performance in the Y-maze and NADT tests, with a spontaneous alternation score of 74.3% compared to 58.2% in the cuprizone-only group ($p<0.05$). The biochemical analyses showed a marked increase in total antioxidant capacity in the combination group (2.5 ± 0.2 mM Fe^{2+}) compared to the control (1.6 ± 0.3 mM Fe^{2+}) and cuprizone-only (1.1 ± 0.2 mM Fe^{2+}) groups ($p<0.05$). MDA levels, indicating lipid peroxidation, were significantly reduced in the combination group (3.1 ± 0.4 µmol/mg protein) compared to the cuprizone-only group (5.2 ± 0.5 µmol/mg protein) ($p<0.05$). Similarly, the activities of SOD, CAT, and GPx were

significantly elevated in the combined treatment group, suggesting enhanced oxidative defense mechanisms. Histopathological analysis of the corpus callosum revealed significant remyelination in the combination group, with increased myelin thickness compared to the cuprizone-only and single-treatment groups.

Conclusion : The simultaneous administration of kaempferol and exosomes derived from bone marrow mesenchymal stem cells significantly promotes myelin repair in a cuprizone-induced demyelination model. This neuroprotective effect may be attributed to the enhanced antioxidant defense and reduction in oxidative stress markers. These findings suggest that combined kaempferol and exosome therapy could be a promising approach for promoting remyelination in demyelinating diseases like multiple sclerosis.

Keywords : Kaempferol; Exosomes; Myelin repair; Demyelination; Oxidative stress; Cuprizone model

Count: 292
Abstract ID: 560
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Relationship between control source and coping styles mediated by mental fatigue and hopelessness in patient with Multiple Sclerosis

Submission Author: Ali Sayadi

Ali Sayadi[1], Fereshteh Shirazi[2]

1. Department of Psychology, Faculty of Psychology and Human Sciences, Central Tehran Branch, Islamic Azad University, Iran. Email: Sayadi20200@Gmail.com
2. Department of Psychology, Faculty of Psychology and Educational Sciences, University of Allameh Tabataba'i, Iran. Email: Shirazi.Fereshteh@Gmail.com

Background and Aim : Multiple sclerosis is a chronic disease in which physical and mental disorders are very common among these patients. Given that patients with multiple sclerosis should always be away from stress and coping styles can play a significant role in improving mood control and stress, so the aim of this study was to investigate the relationship between source of control and coping styles with fatigue mediation in patients with multiple sclerosis in Tehran.

Methods : The statistical population of this study is all patients with multiple sclerosis in Tehran referring to medical centers in Tehran in 1398, which has a population of 360 people. Descriptive and inferential statistical methods such as structural equations were used to analyze the data.

Results : In the first step, the Kolmogorov-Smirnov test was used to measure the normality of the research data distribution status, which showed that all Kolmogorov-Smirnov fits were at a significance level of less than 0.05, which indicated the abnormal distribution of research variables. Then, to measure the effect of independent and dependent variables of the research, the structural equation test was used by Smart Plus software, which showed that the significance level of the research variables was obtained for the hypotheses at an acceptable level (Sigma = 0.000), which is evidence of a relationship between research variables.

Conclusion : The results of the analysis of the previous chapter showed that in terms of gender, 97 out of 186 people, equivalent to 52.2% of the participants, are female and the rest, ie 89 people, equivalent to 47.8% are male. In terms of marital status, 33.3% of the respondents, ie 62 people, are married and 66.7% of the rest, ie 124 people, are single; And it can be seen that most of the people randomly selected in this sample are single; In terms of age, 39.2% are between 20 and 30 years old, and 24.7% are between 30 and 40 years old, and the remaining 2.7% are over 40 years old. , 23 people, ie 12.4% had a master's degree and the remaining 11.3% had a doctorate or higher.

Keywords : Frustration; Mental fatigue; Coping styles; Source of control; Multiple Sclerosis

Count: 293
Abstract ID: 615
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

A Review of Neurophysiological Insights into the Auditory System in Multiple Sclerosis through Auditory Evoked Potentials

Submission Author: Mohaddese Vahabi

Mohaddese Vahabi[1]

1. Student Research Committee, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Conclusion : Introduction: Multiple Sclerosis (MS) is a chronic autoimmune disorder characterized by demyelination and neurodegeneration in the central nervous system. While its impact on the motor system is well-documented, sensory systems, including auditory pathways, are also susceptible to the pathological effects of this disease. The auditory system involves multiple neural relays from the cochlea to the cortex, each susceptible to disruptions by MS pathology. Additionally, auditory issues, such as difficulties in speech perception in noise, have been reported in patients diagnosed with MS. Therefore, comprehensive evaluation of the auditory system is crucial to help the patients mitigate potential negative consequences. Auditory evoked potentials (AEPs) serve as valuable tools for assessing the neural integrity of the auditory system, enabling the estimation of the site and extent of potential lesions. This study aims to explore the AEPs results in MS, focusing on short, middle and late latency responses and their clinical implications. Methods: In this literature review, studies evaluating AEPs in patients with MS, published from 2010 to 2024 in PubMed, Google Scholar, Science Direct and Web of Science were reviewed. According to PRISMA protocol, 19 of the studies met the inclusion criteria and were selected for additional investigations. Finally, the present study was conducted based on the results of these selected articles. Results: Central auditory nervous system dysfunction, evaluated through auditory evoked potentials, despite normal peripheral hearing, has been reported in a significant proportion of patients with MS. Auditory brainstem response (ABR) has been reported to be affected early in MS due to demyelination and neuronal damage, with prolonged wave latencies and reduced amplitudes indicating neural dysfunction at the level of brainstem. Middle latency response (MLRs), which reflects activity in the auditory thalamocortical pathways, has also shown delayed latencies and altered waveforms in this population in several studies, suggesting disruptions in neural conduction. Among all MLR waves, Pa and Pb are frequently delayed in patients with MS, indicating thalamocortical involvement. In addition, late latency responses (LLRs), including P300 and mismatch negativity (MMN), which are associated with higher-order auditory and cognitive processes, have been reported to have reduced amplitudes and prolonged latencies in patients with MS, reflecting deficits in higher-order auditory processing and cognitive functions. Correlation between the abnormalities in AEPs and the severity of MS has also been reported by some studies, suggesting that AEPs can be valuable tools in assessing the progression of this disease. Conclusion: Auditory evoked potentials provide insights into the integrity of auditory pathways and the function of the auditory system in patients with MS. They can be considered as useful assessment measurements to complement the clinical and neuroimaging

findings, aiding in the early detection and monitoring of MS, which facilitate timely intervention and management of the auditory symptoms. Yet, further research is needed to improve diagnostic criteria and highlight the role of AEPs in the clinical evaluation of auditory nervous system function in patients with MS.

Keywords : Multiple Sclerosis; Auditory evoked potentials; Auditory brainstem response; Middle latency response; P300; Mismatch negativity

Count: 294
Abstract ID: 608
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Dysphagia Treatment in Patients with Multiple Sclerosis Using Repetitive Transcranial Magnetic Stimulation (rTMS)

Submission Author: Fateme Khari

Fateme Khari[1], Dr Banafshe Mansuri[2], Dr. Seyed Abolfazl Tohidast[3]

1. Student Research Committee, Semnan University of Medical Sciences, Semnan, Iran
2. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran
3. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran

Conclusion : Introduction: Multiple Sclerosis (MS) is a debilitating disease that often impacts swallowing functions, leading to dysphagia. The prevalence of dysphagia in MS patients is high, resulting in significant health consequences. Traditional treatments offer limited efficacy, making rTMS a promising non-invasive brain stimulation technique worth exploring. This review explores the efficacy of repetitive Transcranial magnetic stimulation (rTMS) in treating dysphagia among patients with Multiple Sclerosis (MS). We discuss the current evidence, underlying mechanisms, and potential benefits of rTMS as a therapeutic intervention for dysphagia in MS patients. The aim of this review is to provide a comprehensive overview of the use of rTMS in treating dysphagia in MS patients, summarizing current research findings and identifying gaps in knowledge. Methods: A comprehensive search was conducted in databases such as PubMed, Embase, and Web of Science, focusing on studies published between 2000 and 2024. Inclusion criteria involved peer-reviewed articles, clinical trials, and meta-analyses relevant to rTMS and dysphagia in MS. Data extraction included participant demographics, stimulation parameters, outcome measures, and reported efficacy. Findings were synthesized qualitatively to identify common themes and outcomes. Results: The review analyzed studies investigating the effects of rTMS on dysphagia in MS patients. Consistent evidence showed improvements in swallowing function, including reduced dysphagia severity and enhanced swallowing efficiency. Mechanistic insights suggested that rTMS modulates neural activity and improves connectivity in swallowing-related brain regions. However, variability in stimulation parameters and individual responses highlights the need for standardized protocols. Conclusion: The review evaluated the effectiveness of rTMS in treating dysphagia in MS patients, highlighting both potential benefits and challenges. Benefits include significant improvements in swallowing function and quality of life, while challenges involve the need for further research to optimize stimulation parameters and standardize treatment protocols. rTMS shows promise as a therapeutic intervention for dysphagia in MS patients, with potential benefits for improving swallowing function and quality of life. Continued research is essential to refine these techniques and establish their clinical utility.

Keywords : Dysphagia ; Multiple Sclerosis ; Treatment ; Transcranial Magnetic Stimulation

Count: 295
Abstract ID: 344
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Cerebrolysin-Loaded Nanoparticles Alleviate Symptoms of EAE via GATA3 and FOXP3 Pathways

Submission Author: Sina Khodakarimi

Sina Khodakarimi[1], Amir Zarebkohan[2], Mohammad Reza Shiri-Shahsavari[3], Abbas Ebrahimi-Kalan[4]

1. Department of Neuroscience and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Medical Nanotechnology, Faculty of Advanced Medical Sciences, Tabriz University of medical sciences, Tabriz, Iran
3. Department of Nutrition, School of Health, Qazvin University of Medical Sciences, Qazvin, Iran
4. Department of Neuroscience and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic autoimmune disorder that primarily affects the central nervous system (CNS), leading to progressive neurological impairment. A novel therapeutic strategy for MS involves the use of cerebrolysin (CBL) encapsulated in TGN-modified chitosan nanoparticles (CBL@TCN), which may offer a significant reduction in symptoms associated with experimental autoimmune encephalomyelitis (EAE), an established animal model of MS.
Methods : This study aimed to investigate the behavioral and biochemical changes during the acute phase of MS using EAE in C57BL/6 female mice. Mice were immunized with myelin oligodendrocyte glycoprotein (MOG35-55) and administered pertussis toxin intraperitoneally (IP). The animals were divided into four groups: a negative control receiving phosphate-buffered saline (PBS) (n=8), a positive control with EAE (n=8), an EAE group treated with cerebrolysin (CBL, 5 mg/kg/day), and an EAE group treated with CBL@TCN (0.5 mg/mouse on the 13th and 19th days post-immunization) (n=8). All treatments were administered via IP injection.
Results : Assessment of clinical scores and analysis of biological samples revealed that mice treated with CBL@TCN demonstrated significant improvements in locomotor activity. This was accompanied by a marked reduction in lymphocyte infiltration in spinal cord tissues when compared to other groups.
Conclusion : In comparison to standard treatment and controls, CBL@TCN showed superior regenerative effects, promoting morphofunctional recovery by activating survival pathways in the EAE model of MS. These findings suggest that CBL@TCN holds promise as an effective therapeutic option for MS.
Keywords : Multiple sclerosis, Cerebrolysin, Neurotrophic factor, TGN Peptide, Targeted delivery

Count: 296
Abstract ID: 478
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Iron dyshomeostasis in white matter tissue of multiple sclerosis patients

Submission Author: Reyhaneh Doost

Reyhaneh Doost[1], Mohammad Javan[2], Yaghoub Fathollahi[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. Institute for Brain and Cognition, Tarbiat Modares University, Tehran, Iran.
3. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.

Background and Aim : Iron is an essential element that works as a cofactor in mitochondrial respiration, neurotransmitter biosynthesis, and myelination enzymes. Several pieces of evidence reveal that iron accumulates in demyelinating lesions in patients with multiple sclerosis (MS), and its intracellular homeostasis is disrupted, which exacerbates inflammation and demyelination.

Methods : We reanalyzed a microarray human MS dataset from GEO DataSests, under accession number GSE108000. We examined differentially expressed genes involved in iron metabolism between different types of MS lesions and peri-lesional normal-appearing white matter (PL-NAWM). We used GEO2R for differential expression analysis and created volcano plots, Venn diagrams, and pie charts for data visualization using RStudio software.

Results : We identified 58 genes involved in iron metabolism within the dataset. The expression of key iron-regulating genes, responsible for iron uptake, storage, and export, including CYBRD1, STEAP3, SLC39A14, FTL, FTH1, and CP were significantly changed. We also indicated significant alterations in the iron regulatory pathways in MS lesions and the PL-NAWM. The most prominent alterations were related to the iron uptake pathway, which showed enhanced activity.

Conclusion : Significant changes in iron regulatory gene expressions across MS lesions and the PL-NAWM may lead to dysregulation in iron homeostasis. This imbalance likely contributes to neurodegenerative processes associated with MS. The modifications in the PL-NAWM can be regarded as early-disease indicators. Recognizing these molecular changes provides valuable insights for facilitating timely MS diagnosis and developing targeted therapeutic strategies.

Keywords : Multiple sclerosis; Iron metabolism; Gene expression; MS lesions; Normal-appearing white matter; Bioinformatics

Count: 297
Abstract ID: 334
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Insights into the interplay between Epstein-Barr virus (EBV) and multiple sclerosis (MS): A state-of-the-art review and implications for vaccine development

Submission Author: Kimia Kazemzadeh

Kimia Kazemzadeh[1], Mahtab Mohammadzamani [2], Swati Chand[3], Sangharsha Thapa[4], Narges Ebrahimi[5], Mohammad Yazdan Panah [6], Vahid Shaygannejad[7], Omid Mirmosayyeb[8]

1. Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran. Network of Neurosurgery and Artificial Intelligence (NONAI), Universal Scientific Education and Research Network (USERN), Tehran, Iran.
2. Isfahan Neurosciences Research Center Isfahan University of Medical Sciences Isfahan Iran
3. Westchester Medical Center New York Medical College Valhalla New York USA.
4. Department of Neurology, Westchester Medical Center New York Medical College Valhalla USA.
5. Isfahan Neurosciences Research Center Isfahan University of Medical Sciences Isfahan Iran.
6. Students Research Committee Shahrekord University of Medical Sciences Shahrekord Iran.
7. Isfahan Neurosciences Research Center Isfahan University of Medical Sciences Isfahan Iran.
8. Isfahan Neurosciences Research Center Isfahan University of Medical Sciences Isfahan Iran.

Conclusion : Given the infectious nature of EBV and its ability to elude the immune system, EBV emerges as a strong candidate for being the underlying cause of MS. The development of an EBV vaccine holds promise for preventing MS; however, overcoming the challenge of creating a safe and efficacious vaccine presents a significant obstacle.

Keywords : EBV vaccination; Epstein-Barr virus; HHV-6; human herpesvirus 6; multiple sclerosis.

Count: 298
Abstract ID: 37
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Effects of acetyl-L-carnitine on nitric oxide level and prefrontal cortex histopathology following C57BL/6 mice cuprizone intoxication

Submission Author: Amin Zolfaghari

Amin Zolfaghari[1], Donya Zare[2], S. Mohammadhadi Mirab[3], Mohammad Javan[4], Forough Foolad[5], Ameneh Omidi[6]

1. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
5. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
6. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Multiple sclerosis (MS) is a heterogeneous chronic demyelinated disorder of the central nervous system (CNS) that mainly affects young adults. Studies reveal that excessive nitric oxide (NO) may trigger other neuro-inflammatory components and free radicals, which may lead to demyelination in various brain regions, such as the prefrontal cortex (PFC). This study evaluated the effect of antioxidant acetyl-L-carnitine (ALC) on NO level and myelin status in the cuprizone mouse model of MS.

Methods : Male adult C57BL/6 mice were randomly assigned to three groups: Group I (CONT), Group II (CPZ), and Group III (CPZ+ALC). For 12 weeks, the CONT group received a normal diet. In contrast, the CPZ group received a meal containing 0.2% cuprizone for the same duration. The CPZ+ALC group received 0.2% cuprizone for 12 weeks and gavage ALC during the final three weeks. After the twelfth week, a Griess assay was utilized to evaluate the NO level in the PFC area. In addition, luxol fast blue/periodic acid-Schiff (LFB/PAS) staining was applied to evaluate myelin status in the PFC.

Results : The NO evaluation in the PFC showed that NO levels were significantly higher in the CPZ group compared to the CONT group ($p<0.05$). However, the group treated with CPZ+ALC showed a significantly lower amount of NO in the PFC compared to the CPZ group ($p<0.05$). Histopathological evaluations showed that demyelination was higher in the CPZ group than in the CONT group ($p<0.05$). ALC administration diminished cortical demyelination so much that there was no significant difference in myelin status between the CPZ+ALC and CONT groups.

Conclusion : ALC has been able to decline NO levels in the prefrontal cortex of cuprizone-intoxicated C57BL/6 mice. These neurobiological effects may be attributed to its ability to modulate brain metabolism.

Keywords : Multiple sclerosis; Cuprizone; Demyelination; Nitric Oxide; Acetylcarnitine

Count: 299
Abstract ID: 22
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Effects of chronic demyelination on testosterone level and hypothalamus histopathology in C57BL/6 mouse model

Submission Author: SeyedMohammadhadi Mirab

SeyedMohammadhadi Mirab[1], Arezoo Dorikhani[2], Amin Zolfaghari[3], Marjan Ghorbani-Anarkooli[4], Ameneh Omidi[5]

1. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
4. Department of Anatomy, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran
5. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic demyelinating neurological disorder characterized by selective myelin degradation and axonal damage. Particular outcomes may occur depending on the affected area. Since any disturbances in the hypothalamic-pituitary-gonadal (HPG) axis may dysregulate testosterone production, we aimed to investigate the impact of cuprizone intoxication on testosterone levels, as well as demyelination of the arcuate nucleus of the hypothalamus.
Methods : Adult C57/BL6 male mice were divided into two groups randomly. For 12 weeks, the control group (CONT) received a regular diet, and the demyelination group (CPZ) was fed a diet containing 0.2% cuprizone to induce chronic demyelination. The serum testosterone levels were measured using a commercial electrochemical luminescence kit at the beginning of the study and at the end of week 12. Additionally, we utilized luxol fast blue/periodic acid-Schiff (LFB/PAS) staining to assess the myelin status in the arcuate nucleus.
Results : The results of measuring serum testosterone levels showed that hormone levels increased in the 12th week compared to day zero in the CONT group. Interestingly, the CPZ group showed no significant differences between the two-time points. The data revealed that the testosterone level in the CPZ group was significantly lower than in the CONT group in the 12th week ($p = 0.03$). Results showed that in the 12th week, the CPZ group had significantly more demyelination of the hypothalamus arcuate nucleus than the CONT group ($p < 0.001$).
Conclusion : Intoxication with CPZ causes chronic demyelination, possibly due to damage to the hypothalamus arcuate nucleus, which disrupts the HPG axis and serum testosterone levels.
Keywords : Multiple sclerosis, Cuprizone, Demyelination, Testosterone, Arcuate Nucleus, Hypothalamus

Count: 300
Abstract ID: 387
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Comprehensive Effects of Ketogenic Diet on Body Composition, Quality of Life, and Neuromuscular Function in Adults with KDMAD

Submission Author: Elahe Movagharnia

Elahe Movagharnia[1], Sarvin Sanaie[2], Amirreza Naseri[3], Mahnaz Talebi[4], Ayda Afkhami anarjan[5], Donya Hashemian[6], Hamid Abbasi[7]

1. Research Center for Evidence-Based Medicine, Iranian EBM Centre: A Joanna Briggs Institute (JBI) Center of Excellence, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Research Center for Integrative Medicine in Aging, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran
3. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran
4. Tabriz University of Medical Sciences, Neuroscience Research Center, Tabriz, Iran.
5. Student Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran
6. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran
7. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : The ketogenic diet is associated with significant positive effects on body composition, quality of life, and neuromuscular function in adults with KDMAD. Improvements in BMI, reductions in fat mass, enhanced psychological well-being, and increased physical capabilities underscore the potential therapeutic benefits of KD. These findings support the implementation of ketogenic dietary interventions for managing KDMAD, though further research is warranted to explore long-term effects and optimize dietary protocols.

Keywords : ketogenic diet; multiple sclerosis; Quality of Life; Body Composition; KDMAD

Count: 301
Abstract ID: 106
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Advances in Functional Magnetic Resonance Imaging (fMRI) Applications in Multiple Sclerosis: A Comprehensive Umbrella Review of Systematic Reviews and Meta-Analyses

Submission Author: Arezoo Fathalizadeh

Arezoo Fathalizadeh[1], Sama Rahnemayan[2], Mahnaz Talebi[3], Amirreza Naseri[4], Elham Mehdizadehfar[5]

1. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran.
2. Department of Biopsychology, Institute of Cognitive Neuroscience, Faculty of Psychology, Ruhr-University Bochum, Germany
3. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran.
4. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
5. Neurosciences Research Center (NSRC), Tabriz University of Medical Sciences, Tabriz, Iran.

Conclusion : Insights from this umbrella review contribute to our understanding of MS pathogenesis and aid in the development of targeted therapeutic interventions. fMRI serves as a valuable tool for monitoring disease progression and personalizing treatment strategies in MS patients. This study addresses a critical gap in the literature, advancing MS research and clinical practice.

Keywords : fMRI, multiple sclerosis, MS

Count: 302
Abstract ID: 685
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Cardiac Arrest Following Natalizumab Therapy in a Patient with Multiple Sclerosis: A Case Report and Review of Literature

Submission Author: Samin Davoody

Samin Davoody[1], Mehran Ghaffari MD[2], Sepideh Paybast MD[3]

1. Affiliation 1 : Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Affiliation 2: Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Neurology, Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Department of Neurology, Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : Multiple sclerosis (MS) is a chronic, immune-mediated neurological disorder that affects more than 2.8 million globally. It is characterized by demyelinating plaques in the central nervous system (CNS), leading to a wide range of physical and cognitive impairments. The introduction of various disease-modifying therapies (DMTs), has significantly improved the management of MS by reducing relapse rates and slowing disease progression. Natalizumab is known as a high-efficacy DMTs. While it's efficacy and safety has been well established, rare serious adverse effects, including hypersensitivity reactions and cardiac arrest during infusion have been reported. This case presents a patient with MS who experienced cardiac arrest following the fourth dose of Natalizumab administration.

Methods : A 35-year-old male presented with symptoms of imbalance and dizziness, suggestive of a demyelinating event of brainstem involvement. Based on clinical evaluation and magnetic resonance imaging (MRI) findings—showing eight supratentorial lesions, one infratentorial lesion, and one spinal cord lesion—he was diagnosed with relapsing-remitting multiple sclerosis (RRMS).

Results : He was initially treated with weekly intramuscular Interferon beta-1a (Cinnovex). The patient remained stable for two years under this regimen. However, during follow-up, an MRI revealed three new T2 lesions, two of which showed gadolinium enhancement, indicating active inflammation. In this regard, the treatment was escalated to Natalizumab. The patient tolerated the first two doses of Natalizumab without significant side effects. However, during the administration of the third dose, mild allergic symptoms, including dyspnea, were observed. After receiving the fourth dose, the patient experienced nausea, vomiting, and ventricular tachycardia, which culminated in cardiac arrest. Immediate cardiopulmonary resuscitation (CPR) was performed successfully, and the patient made a full recovery with an Expanded Disability Status Scale (EDSS) score of zero, indicating no deterioration in neurological function. Following this serious reaction, Natalizumab was discontinued and Ocrelizumab was

initiated as an alternative therapy. Subsequent follow-ups showed neither further complications nor disease progression.

Conclusion : This case underscores the potential for rare but life-threatening cardiac events during Natalizumab therapy in MS patients. While Natalizumab is effective in controlling disease activity, it is crucial for clinicians to be vigilant for signs of hypersensitivity reactions, particularly in patients with prior allergic symptoms. Close monitoring and immediate intervention are essential to prevent serious outcomes such as cardiac arrest. The need for individualized treatment strategies is highlighted, with careful consideration of alternative therapies in patients who experience severe adverse effects.

Keywords : Multiple Sclerosis (MS), Natalizumab, Cardiac Arrest, Hypersensitivity Reactions, Disease-Modifying Therapy (DMT)

Count: 303
Abstract ID: 45
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

The Efficacy of Bruton's Tyrosine Kinase Inhibitors (BTKIs) in Multiple Sclerosis Treatment: A Systematic Review of Clinical Trials

Submission Author: Fateme TavakoliFar

Fateme TavakoliFar[1], Amin Zolfaghari[2], Ameneh Omidi[3]

1. Faculty of Pharmacy, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran
2. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Anatomical Sciences, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Conclusion : In a 16-week, phase-2b trial, different doses of tolebrutinib were tested, showing a dose-dependent reduction in new gadolinium-enhancing lesions over 12 weeks, with 60 mg tolebrutinib once daily being the most effective and well tolerated. RCTs on evobrutinib 75 mg twice/day demonstrated that the mean(±SD) of the total number of gadolinium-enhancing lesions during 12–24 weeks in comparison to dimethyl fumarate(DMF) as a reference was 1.15±3.70 and 4.78±22.05, respectively. The total number of lesions in patients using evobrutinib 75 mg twice/day was 0.44 and 0.30 with evobrutinib 75 mg/day, compared to the placebo, after 24 weeks (P=0.06 and P=0.005, respectively). In another RCT, after 48 weeks of evobrutinib 75 mg twice/day as a well-tolerated treatment, the trial group had no significant effect on the change from baseline in the Expanded Disability Status Scale score(EDSS). In conclusion, the efficacy, well-tolerance, and lack of serious adverse effects of BTKIs as an alternative treatment for MS suggest further research to confirm these findings.

Keywords : Multiple Sclerosis; Bruton's Tyrosine Kinase Inhibitor; Tolebrutinib; Evobrutinib; Clinical trials

Count: 304
Abstract ID: 173
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Oral

Fatigue, stigma, and mood in patients with multiple sclerosis: effectiveness of guided imagery

Submission Author: Mina Beitollahi

Mina Beitollahi[1], Mansooreh Azizzadeh Forouzi[2], Batool Tirgari[3], Yunes Jahani[4]

1. Department of Medical Surgical Nursing, Razi Faculty of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran.
2. Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran.
3. Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran
4. Modelling in Health Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran.

Background and Aim : The present study aimed to assess the effectiveness of guided imagery on fatigue, stigma, and mood in patients with multiple sclerosis

Methods : This clinical trial is a double-blind study that was conducted on 60 patients with multiple sclerosis referred to the largest center for special diseases in the southeast of Iran in 2020. The convenience sampling method was used to select the participants who were later divided into two groups of intervention (n=30) and control (n=30) using block randomization method. The intervention group listened to the guided imagery audio fle at home for 25 min. The control group did not receive any intervention. Data were collected by demographic information questionnaires, Fatigue Severity Scale (FSS), Reece Stigma Scale for Multiple Sclerosis (RSS-MS), and the Profile of Mood States (POMS) before and one month after the intervention.

Results : According to the results, there was no significant difference between the two groups before the intervention in terms of the score of fatigue (P<0.0=67), stigma (P<0.64), and mood (P<0.17). However, after the intervention, a significant differences was observed in this regard (P<0.0001). In the intervention group, the mean score of fatigue decreased from 59.72±18.32 to 35.8±16.15, and the mean score of stigma decreased from 17.31±15.62 to 5.09±8.06, showing a signifcant reduction in the levels of fatigue (P<0.0001) and stigma (P<0.0001) compared to before intervention. Also, the mean score of mood decreased from 36.90±12.21 to 28.55±11.87, indicating an improvement in the mood of samples in the intervention group (P<0.0001).

Conclusion : The results indicated that guided imagery, as a cost-efective method, can decrease the fatigue and stigma, and enhance the mood of patients with MS. Therefore, nursing staff can use this method to improve MS patients' mood and decrease their fatigue and stigma.

Keywords : Multiple sclerosis, Guided imagery, Fatigue, Stigma, Mood

Count: 305
Abstract ID: 643
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

A Case Report of Devic's Syndrome

Submission Author: Saba Rahmati

Saba Rahmati[1], Maryam saeedi[2], Shima mohammadi[3]

1. Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
2. Department of Neurology, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran
3. Department of Neuroscience, School of Public Health, Shahroud University of Medical Sciences, Shahroud, Iran

Background and Aim : A 35-year-old female patient referred to Imam Hossein Hospital in Shahroud with the chief complaint of paraparesis for five days, accompanied by urinary and fecal incontinence. Diagnostic methods, including MRI and Anti NMO Ab testing, were performed, and the final diagnosis was Devic's syndrome. a disease characterized by autoimmune inflammation of the optic nerve and spinal cord is called Devic's syndrome or Neuromyelitis Optica (NMO).

Methods : This article reports a case of a 35-year-old female patient who was diagnosed with Devic's syndrome and admitted to the hospital.

Results : The patient reported no specific underlying medical conditions and was not on any medications. She had a history of one similar attack seven years prior and had also experienced a unilateral episode of optic neuritis. On clinical examination, her muscle strength was 4/5, which decreased to 2/5 during hospitalization. The deep tendon reflexes (DTR) were absent. The patient exhibited dysesthesia and paresthesia. Position and vibration sense tests were impaired, and Babinski's sign was bilaterally positive. The cranial nerve and optic nerve examinations were normal. MRI revealed an extensive lesion from T4 to T11, accompanied by spinal cord swelling.

Conclusion : The patient received corticosteroid pulse therapy at a dose of 1 gram per day for five days. Her symptoms improved, and she was discharged with the recommendation to undergo physical therapy. Immunosuppressive medications were also initiated.

Keywords : Devic's syndrome; Neuromyelitis optica; Optic neuritis; Paraparesis; Autoimmune inflammation

Count: 306
Abstract ID: 408
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Predicting active lesions in Multiple Sclerosis from MRI images without injection of contrast agents using deep learning

Submission Author: AmirAbbas Amini

AmirAbbas Amini[1], Raheleh Kafieh [2], Azin Shayganfar [3], Zahra Amini [4], Leila Ostovar [5], Somayeh Haji Ahmadi [6]

1. School of Advanced Technologies in Medicine, Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Engineering, Durham University, Durham, UK
3. Department of Radiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
4. School of Advanced Technologies in Medicine, Medical Image and Signal Processing Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
5. Department of Radiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
6. Department of Radiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Background and Aim : Multiple sclerosis (MS) is the most common demyelinating disease that affects the central nervous system. This disease includes active and inactive lesions, whose diagnosis is important for neurologists. For this purpose, before magnetic resonance imaging (MRI), gadolinium-based contrast agents are injected. The properties of these agents enable the identification of active lesions, but studies show that these materials can cause complications for patients. Therefore, we must look for an alternative method that can detect lesions without using contrast materials. In this research, we examine deep learning methods, which is one of the methods based on artificial intelligence, to distinguish active from inactive lesions in MRI images.

Methods : MRI data were obtained from four different imaging centers in Isfahan City. These data included 9097 lesions from 130 patients. At first, all lesions were identified and labeled by two radiologists. Then the location of the lesions was selected as ROI according to the size of the lesions. These ROIs were used as input data in the deep learning neural network. Also, Enhanced lesions on the post-contrast T1-weighted images of the patients served as the ground truth. Then, a convolutional neural network(CNN) was designed and trained to predict active and inactive lesions. Also, to check and compare the performance of the designed CNN network, the two pre-trained networks, DensNet 121 and Inception-ResNet were used to predict active and inactive lesions.

Results : The statistical results for the designed CNN network were obtained as an accuracy of 86%, sensitivity of 76%, specificity of 95%, and AUC of 0.90. These values for DensNet 121 were 74%, 65%, 83%, and 0.85, respectively, and for Inception-ResNet, 76%, 60%, 92%, and 0.86, respectively.

Conclusion : The use of deep learning on normal MRI images was able to identify active lesions in MS without the need to inject contrast agents and with high accuracy. This method can help neurologists in diagnosing MS lesions.

Keywords : Multiple Sclerosis (MS); Artificial Intelligence; Deep Learning; Non-contrast MRI; Demyelinating Disease

Count: 307
Abstract ID: 589
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Effect of Electromagnetic fields (EMF) on Apoptotic cells in Hippocampus Mitochondria of rat by Tunel Method

Submission Author: Fateme Abdolhosseinzaderoveshti

Fateme Abdolhosseinzaderoveshti[1], farzane teimouri[2], keyvan kiyani[3], leyla roshangar[4], Amir A Khaki[5]

1. Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Neuroscience, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Anatomical Sciences, Tabriz University of Medical sciences, Tabriz-Iran
5. Department of Anatomical Sciences, Tabriz University of Medical sciences, Tabriz-Iran

Background and Aim : The increasing reliance on electrical and electronic devices in modern society has led to greater exposure to electromagnetic fields (EMF). As these devices proliferate, concerns regarding their potential biological effects grow. This study aims to investigate the specific effects of EMF exposure on apoptotic mitochondria cells within the hippocampus of rats, contributing to understanding the broader implications of EMF exposure on health.

Methods : This experimental study was conducted at the Anatomy Department of Tabriz University of Medical Sciences. We utilized a sample of 24 Wistar rats, which were divided into two distinct groups: a case group and a control group. To generate electromagnetic fields, we employed a specialized device capable of producing an intensity of 3 microtesla. The rats in the case group were subjected to this electromagnetic field for 4 hours daily over a span of 10 weeks. In contrast, the control group was not exposed to any electromagnetic fields, serving as a baseline for comparison. Upon completion of the 10 weeks, the rats were humanely euthanized under anesthesia for the purpose of evaluating apoptotic changes in their hippocampal tissue. After euthanasia, the hippocampi of the rats were meticulously dissected and prepared for examination. We performed various histological techniques to identify and quantify apoptotic cells, focusing specifically on mitochondrial integrity and structure. Ultramicroscopic analyses were also conducted to assess the extent of ultra-structural changes induced by EMF exposure, providing insight into the cellular mechanisms at play.

Results : The findings of our study indicate a marked difference between the two groups. The case group exhibited significantly higher ultra-structural changes in hippocampal cells compared to the control group. Notably, the number of apoptotic cells in the hippocampus was also considerably elevated in the case group, with statistical analyses confirming a high significance level ($P<0.001$). These results suggest that EMF exposure may directly induce

cellular stress and contribute to increased apoptosis in mitochondrial cells within the hippocampus. Additionally, the examination revealed alterations in mitochondrial morphology, which could implicate disruptions in energy metabolism and cellular function. Such changes might underlie the cognitive and behavioral deficits previously reported in studies examining EMF effects in animal models.

Conclusion : The study's conclusions underscore the potential detrimental effects of electromagnetic fields on biological tissues, specifically highlighting mitochondrial cell damage as a significant consequence of EMF exposure. Given the proliferation of electronic devices in daily life, the findings raise critical concerns regarding the safety of prolonged exposure to EMF, particularly for vulnerable populations. Therefore, it is advised that unnecessary or extended exposure to electromagnetic fields be minimized to mitigate potential cellular damage and preserve cognitive health. Further research is warranted to explore the long-term implications of EMF exposure and its effects on various biological systems, which could ultimately inform public health recommendations and regulatory policies. This study serves as a crucial step toward a deeper understanding of EMF's impacts, paving the way for future investigations into its broader biological and physiological consequences.

Keywords : Apoptosis Electromagnetic fields- Hippocampus - mitochondria Rat

Count: 308
Abstract ID: 271
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Biomarkers and brain trauma

Submission Author: Negar Khaki

Negar Khaki [1], Kimia tanoorsaz[2], Reza tirgar fakheri[3]

1. General medicine international university and cellular and molecular biology Azad university
2. General medicine international university
3. General medicine international university

Conclusion : Future Directions and Emerging Biomarkers in Brain Trauma The integration of digital biomarkers could revolutionize the approach to managing traumatic brain injury (TBI). With traditional biomarkers often lacking the immediacy required for urgent clinical decisions, wearable technology provides real-time insights into patient conditions. For example, these devices can detect falls or changes in activity levels, offering timely alerts that improve responsiveness in emergency situations (Kengo Nishimura et al., 2022). Furthermore, leveraging both digital and protein biomarkers enhances the overall understanding of TBI recovery, allowing for personalized treatment plans that address individual patient needs. This dual approach not only aids in monitoring recovery but also supports research into effective therapies. Continuous data collection from digital sources can inform clinical decisions, thereby optimizing outcomes and ultimately leading to better management of TBI in diverse patient populations.

Keywords : Neuroscience trauma

Count: 309
Abstract ID: 320
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Somatotopic representation of action verbs: evidence from aphasia

Submission Author: Fateme Alipur

Fateme Alipur[1], Fariba Yadegari[2], Robab Teymouri[3]

1. Department of speech therapy, University of social Welfare and Rehabilitation Sciences, Tehran, Iran
2. Department of speech therapy, University of social Welfare and Rehabilitation Sciences, Tehran, Iran
3. Pediatric Neurorehabilitation Research Center, university of social welfare and rehabilitation sciences, Tehran, Iran

Background and Aim : the function of sensorimotor information in language processing may be explained via the embodied cognition account; accordingly, the action verb naming might be coincided by mental representations in the cortical motor system. Action verbs comprise motor components, so, motor representation may be an automatic part of the verbs semantic processing. The action depicted in a verb name may be simulated mentally by Non-Brain-Damaged (NBD) speakers. This relationship between the name of an action verb and the motor cortex may form a somatotopic map. As the action verb naming may be dissociated in aphasia (an acquired language disorder), we aimed at examining the types of error in the action verb naming in people with aphasia (PWA) seeking for such somatotopic associations.

Methods : forty-five people participated in this study comprising 11 fluent PWA (including 5 males; mean age=58.27 years, mean post-onset time (POT)=18.73 months), 9 non-fluent PWA (including 6 males; mean age=53.33 years, mean POT=81.11months), and 25 NBD individuals (including 5 males; mean age=28.9 years). The task protocol for eliciting speech samples contained the Persian Narrative Discourse Test (PNDT) (Ghayoumi et al., 2015), Picture description task (Nilipour et al., 2016), and open-ended questions. Percentages of produced somatotopic verbs i.e., verbs in relation to body parts such as /run/ (relating to leg), /eat/ (relating to mouth), and /grasp/ (relating to hand) were calculated. Also, an error analysis regarding the somatotopic verbs was accomplished. The inter-rater and intra-rater reliability was calculated for 25% of the speech samples.

Results : it was revealed that the fluent and non-fluent PWAs produced more somatotopic verbs than the NBD group (mean percentage: NBD=18.48, fluent PWA=30.55, non-fluent PWA=26.33; P-value=0.028). In action naming task in which we could detect the errors of naming, fluent PWA produced twice as many semantic paraphasia with somatotopic connection as nonfluent PWA. The production of random paraphasia with somatotopic connection was seen in fluent PWA (the number was trivial in the nonfluent group). Inter-rater and intra-rater agreement was 96% and 98%, respectively.

Conclusion : The reason for the higher mean percentage of somatotopic verbs in our PWAs may be their reliance on the sensorimotor information to overcome the verb retrieval problems. In fact, the activated sensorimotor representations helped to produce or retrieve the verbs, a

finding which seems in line with the embodied cognition account. High number of semantic/random paraphasias with somatotopic associations in the fluent PWA through the task of action naming, may be explained via mirror neurons hypothesis. We may assume that the activation threshold of sensorimotor representations was lower in the fluent PWA leading to prioritize these representations while the non-fluent PWA did not depict such somatotopic preferences. This may be due to the probable involvement of LIFG area including area BA44 i.e., the supposed site of the mirror neurons responsible for action simulation.

Keywords : aphasia; verb retrieval; somatotopic representation; mirror neurons

Count: 310
Abstract ID: 332
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Beyond traditional predictors: the impact of the pulsatility index and cortical subarachnoid space diameter on endoscopic third ventriculostomy success

Submission Author: Adrina Habibzadeh

Adrina Habibzadeh[1]

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

Background and Aim : Determining the long-term success of endoscopic third ventriculostomy (ETV) remains challenging. This study aimed to investigate the impact of clinical and radiological factors on ETV success in pediatric patients with hydrocephalus.

Methods : The study included patients < 18 years old with hydrocephalus who underwent ETV between March 2014 and May 2021. Data including patient age, gender, history of previous shunt surgery, previous external ventricular drain placement, intraventricular hemorrhage history, and postoperative meningitis were extracted from medical records. Imaging features such as aqueductal stenosis, third ventricle floor bowing, displaced lamina terminalis, pulsatility index (PI), and maximum diameter of the cortical subarachnoid space (CSAS) were recorded for each patient using preoperative CT scans. Two independent neurosurgeons measured the CSAS maximum diameter and the PI. CSAS measurements were obtained on axial slices of the preoperative CT scans, whereas the PI was based on intraoperative third ventricle pulsatility. Patients were followed up for 1 year after surgery, with failure defined as the need for ventriculoperitoneal shunt (VPS) placement or death attributable to hydrocephalus.

Results : Ninety-eight children with a mean age of 16.39 ± 19.07 months underwent ETV for hydrocephalus. No deaths were recorded, but over 6 months and 1 year of follow-up, 12.2% and 22.4% of patients, respectively, experienced documented ETV failure requiring VPS placement. At the 6-month follow-up, a smaller maximum diameter of the CSAS was significantly associated with ETV failure; multivariate analysis revealed that CSAS maximum diameter was a predictor of 6-month ETV failure. At the 1-year follow-up, a lower PI was significantly associated with ETV failure, and multivariate analysis confirmed the PI as a significant predictor of ETV failure within 1 year after surgery. CSAS and PI measurements were repeated to assess interrater reliability: the intraclass correlation coefficients were 0.897 and 0.669 for CSAS and PI, respectively.

Conclusion : This study found that the CSAS maximum diameter and the PI are predictors of ETV failure at 6 months and 1 year, respectively. These findings highlight the importance of considering specific factors such as the CSAS and PI when assessing the likelihood of ETV success in pediatric patients with hydrocephalus. Further research and consideration of these

factors may help optimize patient selection and improve outcomes for those undergoing ETV as a treatment for hydrocephalus.

Keywords : hydrocephalus; cortical subarachnoid space; third ventricle; endoscopic third ventriculostomy; ETV success

Count: 311
Abstract ID: 425
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

Curcumin alleviates inflammatory effects of ketamine anesthesia in postnatal rats

Submission Author: Sohrab Minaei beirami

Sohrab Minaei beirami[1], Soroush Afshar Ghahremani[2], Abbas Raisi[3], Houman Kahroba[4], Mahnaz Mardani[5], Omid Dezfoulian[6], Vahideh Tarhriz[7]

1. 1 Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran 2 Department of Biochemistry and Clinical Laboratories, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Clinical Sciences, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran
3. Department of Clinical Sciences, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran
4. Department of Molecular Medicine, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
5. Department of Health and Nutrition, Nutritional Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran
6. Department of Pathobiology, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran
7. Cardiovascular Center of Excellence, Louisiana State University Health Sciences Center, New Orleans, USA

Background and Aim : Curcumin has been employed in traditional medicine for over a millennium to treat various ailments, and its global use is now widespread. Chinese medicine relies heavily on curcumin as a primary element and uses it to cure infectious diseases, skin disorders, depression, and stress. It has cardioprotective, neuroprotective, and anti-diabetic properties, as well as pharmacological effects on disorders like type II diabetes, atherosclerosis, and human immunodeficiency virus replication. The anti-cancer activity of curcumin has been studied extensively with notable improvements in gastrointestinal, melanoma, urogenital, breast, and lung malignancies.

Methods : We investigated the anti-inflammatory effects of curcumin on expression of tumor necrosis factor (TNF)-α, c-Fos, and interleukin (IL)-6 genes in brain and liver tissue owing to the effects of ketamine anesthesia on postnatal rats. The thalamic and hepatic tissues were collected without anesthesia, immediately after anesthesia, and 4 and 12 hr after anesthesia in control and curcumin treated postnatal rats.

Results : The results showed that glucose, triglyceride, high- and low-density lipoprotein levels were lowered with curcumin treatment. We also found that ketamine increased c-Fos and inflammatory cytokines like TNF-α and IL-6, all of which contribute to inflammation. Brain and liver immunohistochemistry studies confirmed the real-time polymerase chain reaction findings.

Conclusion : Curcumin injections alone may be effective in decreasing ketamine-induced inflammation in both brain and liver tissues

Keywords : Brain; Curcumin; Ketamine; Liver; Real-time polymerase chain reaction

Count: 312
Abstract ID: 482
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Oral

Upregulation of apoptotic genes and downregulation of target genes of Sonic Hedgehog signaling pathway in DAOY medulloblastoma cell line treated with arsenic trioxide

Submission Author: Mehrdad Ghorbanlou

Mehrdad Ghorbanlou[1], Fatemeh Moradi[2], Mehdi Mehdizadeh[3], Ronak Shabani[4]

1. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran
2. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran
3. Reproductive Sciences and Technology Research Center, Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran
4. Reproductive Sciences and Technology Research Center, Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Sonic hedgehog (SHH) medulloblastoma etiology is associated with the SHH molecular pathway activation at different levels. We investigated the effect of arsenic trioxide as a downstream-level inhibitor of the SHH signaling pathway on morphology, cytotoxicity, migration, and SHH-related and apoptotic gene expression of DAOY cells.

Methods : Cells were treated at various arsenic trioxide (ATO)concentrations (1, 2, 3, 5, and 10 lM) for different times (24 and 48 hr). Following treatments, the morphology of the cells was investigated at ⁄20 and ⁄40 magnification by an inverted microscope. Then, cytotoxicity was investigated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and trypan blue assays. Cell migration was analyzed through the wound-healing assay. Furthermore, the expression of SHH-related (GLI1, GLI2, SMO, and MYCN) and apoptotic genes (BAX, BCL2, and TP53) was assessed by real-time quantitative polymerase chain reaction (qPCR).

Results : Morphological changes were seen at 3 and 2 lM in 24 and 48 hr of treatment, respectively. The MTT assay showed a dose-dependent cytotoxicity indicating an IC50 value of 3.39±0.35 and 2.05±0.64 lM in 24 and 48hr treatment, respectively. In addition, the trypan blue assay showed higher IC50 values of 4.29±0.25 and 3.92±0.22 lM in 24 and 48 hr treatment, respectively. The wound-healing assay indicated a dose-dependent reduction of cell migration speed showing a 50% reduction at 2.89±0.26 lM. Significant downregulation of GLI1 and GLI2, as well as the upregulation of BAX, BAX/BCL2 ratio, and TP53 were evident.

Conclusion : Significant increases in GLI1 and MYCN markers were also evident in immunocytochemistry. ATO, as a downstream effective inhibitor of the SHH pathway, substantially leads to cell death, cell migration inhibition, apoptosis upregulation, and downregulation of SHH target genes in DAOY medulloblastoma. Since ATO is a toxic

chemotherapeutic agent, it must be used at low concentrations (2 lM) in order not to damage healthy cells.

Keywords : Medulloblastoma; morphology; cytotoxicity; arsenic trioxide; wound healing assay; apoptosis

Count: 313
Abstract ID: 644
subject: Neural Injuries and Neurodegenerative Disorders: Other
Presentation Type: Poster

The effect of intermittent fasting on neurodegenerative diseases

Submission Author: Kiarash Gholizadeh

Kiarash Gholizadeh[1], Narges Koohi[2], Salar Lak[3], Amirreza Naseri[4], Niloofar Rezaei[5], Leila Nikniaz[6], Sevana Daneghian[7]

1. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
2. Student Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran.
3. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
4. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.
5. Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran.
6. Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran.
7. Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran.

Conclusion : Neurodegenerative disorders like Alzheimer's and Parkinson's involve neuron loss and affect millions worldwide. While medications can manage symptoms, they don't tackle the underlying causes. Intermittent fasting (IF), a dietary approach alternating fasting with unrestricted eating, shows potential for weight loss similar to caloric restriction (CR). This study aimed to explore the impact of IF on neurodegenerative diseases. Methodologically, the review focused on cognitive function studies, excluding animal research, conference abstracts, non-English publications, and retracted literature. Risk of bias assessment followed the Joanna Briggs Institute's critical appraisal tool, employing an eight-question checklist for cross-sectional studies. This systematic review began with an initial screening of 896 studies at the title/abstract stage and included 11 studies. Among the reviewed articles, five were related to multiple sclerosis (MS), four were seizures, one was stroke, and one was glioma. These articles suggest the therapeutic effects of IF in improving cortical volume and thickness and mitigating neuroinflammation in patients with MS disease. Intermittent fasting may have an improving effect, as well as a post-fasting effect, on active focal, myoclonic, and absence seizures, which led to a further decrease in seizure frequency in some cases. IF can reduce intolerance, especially the incidence of diarrhea in patients with hemorrhagic stroke. IF is feasible and effective in inducing ketosis in heavily pretreated patients with recurrent glioma, which also affects tumor cell growth. Our study reports the effectiveness of intermittent fasting in patients with neurological disorders. It shows that this diet can reduce or even cure some disease symptoms.

Keywords : Intermittent fasting; Neurodegenerative conditions; Systematic review; Multiple sclerosis; seizure

Count: 314
Abstract ID: 688
subject: Development: Neurogenesis and Gliogenesis
Presentation Type: Oral

New insights into neural induction in vertebrate embryo

Submission Author: Mohsen Sagha

Mohsen Sagha[1], Mohsen Sagha[2]

1. Research laboratory for Embryology and Stem cells, Department of Anatomical Sciences, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran
2. Research laboratory for Embryology and Stem cells, Department of Anatomical Sciences, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran

Conclusion : Neural induction is a process through which the ectodermal cells acquire the neural fate via BMP signaling inhibition, a state commonly regarded as the “default” in vertebrate embryos. Recent studies have revised the default model of neural induction, suggesting that active signals also play a role in generating neural fate. Research in vertebrate embryos has demonstrated that active FGF/MAPK signaling in the epiblast is crucial for downregulating BMP signaling to promote neural induction. Thus, I propose that FGF stimulation/BMP inhibition can better describe the default model of neural induction. Moreover, the neuroectodermal cells are initially destined to develop into anterior forebrain tissue (Activation step) which subsequently stabilizes with cranial signals and acquires more posterior fate, including midbrain, hindbrain and spinal cord by a gradient of caudalizing signals secreted form the paraxial mesoderm (Transformation step). Furthermore, at the caudal end of the embryo, there are neuromesodermal progenitor cells in the lateral epiblast which possess a dual neural/mesodermal fate, contributing to both neural progenitor cells in the extending spinal cord and mesodermal cells that ingress to form the paraxial mesoderm through balancing between FGF, Wnt and RA signaling pathways. These findings led me to propose an additional step, termed elongation to the classical 3-step model of neural induction, introducing an extended version as activation / stabilization / transformation / elongation.

Keywords : Neural induction, Default model, Neuromesodermal cells, BMP signaling, FGF signaling,

Count: 315
Abstract ID: 302
subject: Development: Neurogenesis and Gliogenesis
Presentation Type: Poster

Auditory Deprivation in Early Life Reduces Hippocampal Neurogenesis in Adult Rats

Submission Author: Marjan Mirsalehi

Marjan Mirsalehi[1], Zeinab Akbarnejad[2]

1. ENT and Head and Neck Research Center and Department, The Five Senses Health Institute, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. ENT and Head and Neck Research Center and Department, The Five Senses Health Institute, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background and Aim : Early auditory input is critical in developing the central nervous system. Previous studies have shown that children with hearing loss can have varying degrees of cognitive impairment. This suggests that early-life hearing loss affects not only the central auditory system but also other brain structures such as the hippocampus. The current study investigates the effect of auditory deprivation during critical brain development on hippocampal neurogenesis in young adult rats.

Methods : The pups of Wistar rats were divided into 2 groups of 7 pups each (sham group and 14-day group). Bilateral cochlear ablation was performed 14 days postnatally in the intervention group. Auditory deprivation was confirmed by auditory brainstem response (ABR). Two months after the intervention, the animals were evaluated. Neurogenesis was assessed by the level of expression of doublecortin and Ki-67 in the dentate gyrus of the hippocampus

Results : We performed ABR in three stages: initially before the intervention, after cochlear ablation, and finally at the end of the second month. The results showed that after cochlear ablation and also at the end of the second month, the hearing threshold levels significantly decreased by up to 90 dB compared to the baseline and sham group. This indicated the success in inducing permanent hearing loss in the rats. Also, our results showed that the expression of Doublecortin and Ki67 decreased significantly in the group with cochlear ablation (14-day) two months after the intervention compared to the sham group.

Conclusion : Hearing deprivation due to cochlear ablation during the critical period impaired neurogenesis in the hippocampus. The presence of proper auditory inputs during early life has an important role in hippocampal function in adulthood.

Keywords : Hearing loss; Cochlear ablation; Hippocampus; Neurogenesis

Count: 316
Abstract ID: 590
subject: Development: Neuronal Cell Death
Presentation Type: Poster

Neuronal cell death in neurodegenerative diseases; a review article.

Submission Author: Ayda Khatibi

Ayda Khatibi[1]

1. Department of Biological Sciences, Faculty of Basic Sciences, Nabi Akram University, Tabriz, Iran.

Conclusion : Introduction: During normal neuronal development, tightly regulated programmed cell death (PCD) signaling events take place in a spatially and temporally restricted manner. These events play a crucial role in establishing the neural architecture and shaping the central nervous system (CNS). Aberrations in PCD signaling pathways, encompassing apoptosis, necroptosis, pyroptosis, ferroptosis, and cell death linked to autophagy, as well as in unprogrammed necrosis, are evident in the etiology of various neurological disorders. Aberrant activation of PCD pathways is a prevalent characteristic observed in various neurodegenerative conditions, including amyotrophic lateral sclerosis (ALS), Alzheimer's disease, Parkinson's disease, and Huntington's disease. This abnormal activation leads to the undesired loss of neuronal cells and impaired functionality. Given the observation that numerous brain diseases manifest abnormalities in PCD pathways, it is evident that agents capable of either impeding or promoting PCD may constitute pivotal elements of forthcoming therapeutic approaches. The current treatment approaches for many neurodegenerative diseases and brain cancers yield only modest effects. As a result, there is a pressing need to conduct investigations into the etiology of these conditions. In this review, we provide a concise overview of PCD and unprogrammed cell death processes, elucidating their respective roles in contributing to neurodegenerative diseases and tumorigenesis within the brain. Method: In our research, we examined articles from several reputable sources including Scopus, PubMed, Google Scholar, Civilica, and ScienceDirect. Our search terms focused on Programmed cell death (PCD), Neurological Disease, central nervous system (CNS), and Biomarkers in Neurological Disease. We specifically targeted recent articles and their respective references as key sources. Our search was confined to articles published in English and Persian. Results: Many neurodegenerative disorders and brain cancers are linked to dysfunctions in PCD, involving either the inappropriate elimination of cells that should survive or the misguided survival of cells that should undergo programmed death. Recent research indicates the presence of non-apoptotic forms of programmed cell death, such as autophagic programmed cell death. Developing a comprehensive mechanistic classification of all PCD forms promises to provide valuable insights into cell death processes associated with different disease states and may lead to innovative therapeutic strategies. Conclusions: In the context of most neurodegenerative diseases, it remains unclear whether the observed defects in cell death play a direct causal role or represent a consequential response to tissue insult. Consequently, it is uncertain whether intervention to block this cell death process would lead to improved therapeutic outcomes. We argue that further research, encompassing both fundamental investigations in animal models and analyses involving patient data, is essential to gain a more comprehensive understanding of the roles played by various cell death processes in brain

diseases. This knowledge is crucial for the development of truly groundbreaking advancements in their treatment.

Keywords : Programmed cell death (PCD); Neurological Disease; central nervous system (CNS); Biomarkers in Neurological Disease.

Count: 317
Abstract ID: 550
subject: Development: Neuronal Cell Death
Presentation Type: Poster

Melamine Toxicity: Implications for Neurotoxic Effects, and Prenatal Exposure Consequences

Submission Author: Hamid Askari

Hamid Askari[1], Maryam Ghasemi Kasman [2]

1. Research Committee, Babol University of Medical Sciences, Babol, Iran
2. Department of Physiology, Babol University of Medical Sciences, Babol, Iran

Conclusion : Introduction: Melamine, a nitrogen-rich compound used in industrial manufacturing, has gained attention due to its illegal addition to food products to increase protein content. This practice has led to severe impairments and fatalities, particularly in infants. Melamine can form crystals in the urinary tract, causing various clinical symptoms and kidney-related complications. Additionally, melamine exposure during prenatal development has been associated with histopathological changes, inflammation, and cognitive deficits in offspring. The neurotoxic effects of melamine include inhibition of synaptic transmission and oxidative damage. In this narrative review we most discuss about the neurotoxic effects of melamine Methods: A comprehensive review of the literature was conducted to examine the effects of melamine on human health. Various databases, including PubMed and Google Scholar, were searched using relevant keywords such as "melamine toxicity," "urinary tract stones," "neurotoxicity," and "prenatal exposure." Studies published between 2000 and 2023 were included in the review. Results: Melamine ingestion has been linked to the formation of crystals in the urinary tract, leading to clinical symptoms such as hematuria, urolithiasis, and kidney stones. The size and formation of these crystals depend on factors such as duration and amount of melamine exposure, pH levels, and gender. Animal studies have demonstrated that melamine can cross the placental barrier and accumulate in various tissues of the fetus, including the brain, kidneys, lungs, and heart. Prenatal melamine exposure has been associated with reductions in hippocampal weight, alterations in calcium homeostasis, apoptosis, and cognitive dysfunction. Melamine exposure also affects synaptic plasticity, including long-term potentiation (LTP) and long-term depression (LTD), which are cellular models of learning and memory. Conclusion: Melamine exposure poses significant risks to human health, particularly in vulnerable populations such as infants and developing fetuses. It can lead to the formation of crystals in the urinary tract and cause kidney-related complications. Neurotoxic effects of melamine include inhibition of synaptic transmission and oxidative damage. Understanding the mechanisms underlying melamine toxicity is crucial for developing interventions and enhancing food safety regulations to prevent contamination. Further research is needed to investigate the long-term consequences of melamine exposure and identify effective preventive measures.

Keywords : melamine toxicity, urinary tract stones, neurotoxicity, prenatal exposure, synaptic plasticity

Count: 318
Abstract ID: 122
subject: Development: Evolution of Developmental Mechanisms
Presentation Type: Poster

Sperm DNA damage: The effect of stress and everyday life factors

Submission Author: Ramin Ahmadzadeh

Ramin Ahmadzadeh [1], Tahereh Pourmirzaei Sheikhalikelayeh[2], Saba Hamideh[3], Nafiseh Najar Sheshgelani[4], Amir fattahi[5]

1. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
3. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
4. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
5. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : The clinical importance of sperm DNA damage is highlighted by its correlation with natural conception rates and its potential impact on the developmental outcomes of newborns. This study aims to investigate the relationship between stress and daily life factors and sperm DNA damage in adult males.
Methods : The study population consisted of 50 men who attended the infertility clinic for diagnostic purposes and who had normal semen concentration of 20-300 m ml(-1) or with slight oligozoospermia (semen concentration of 15-20 m ml(-1)) (WHO, 1999). Participants underwent interviews and provided semen samples for analysis. The sperm chromatin structure was evaluated through DFI(DNA Fragmentation Index).
Results : The findings of this study indicate a correlation between sperm DNA damage parameters and various factors encountered in daily life. Specifically, elevated levels of occupational stress and advancing age were associated with an increase in the DNA fragmentation index (P=0.03, P=0.004, and P=0.03, respectively). Additionally, lifestyle factors such as obesity and prolonged cell phone usage exceeding ten years were positively correlated with a higher percentage of immature sperm, as indicated by the DNA stainability index (P=0.02 and P=0.04, respectively).
Conclusion : The results of our research suggest that stress and lifestyle factors may influence sperm DNA integrity. The data obtained from this study revealed a notable impact of age, obesity, exposure to mobile phone radiation, and occupational stress on sperm DNA damage. Given that DNA fragmentation is a critical indicator of infertility and can significantly affect the success of assisted reproductive treatments, understanding the modifiable lifestyle factors that contribute to DNA damage is essential.
Keywords : Stress; Life factors; Developmental outcome; Newborn; DFI

Count: 319
Abstract ID: 62
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

The Impact of the Cognitive Learning Model on Phonological Awareness in Autistic Children

Submission Author: Masoud Moghaddamnia

Masoud Moghaddamnia[1], Maryam Khalilkhaneh[2]

1. Assistant Professor, Psychiatrist, Medical Science, Shahed University, Tehran, Iran
2. Linguistics, Ferdowsi University of Mashhad, Mashhad, Iran

Background and Aim : Since phonological awareness is one of the significant symptoms in autistic children that affects their writing performance and has a direct and meaningful relationship with spelling skills, there is a pressing need for appropriate training in this area. One common method is the cognitive learning model, which we will evaluate in this article regarding its impact on this issue.

Methods : In this study, 24 autistic children aged between 8-10 years, who were similar in terms of EEG wave patterns, risperidone medication use, and the severity of symptoms, were divided into two equal groups of 12, consisting of 6 boys and 6 girls each. The test used to assess phonological awareness was the Phonological Awareness Skills Test (P.A.S.T). Following this, a spelling test consisting of 25 words was administered to these individuals. The words were categorized into simple and complex groups, with each group adhering to the Persian syllable structure, adding one syllable, consonant, or vowel according to phonetically and phonological protocols. These included: CV, CVC, CVCC. During this period, both groups continued their regular training. In the intervention group, necessary training was provided for 10 weeks, twice a week, with each session lasting 45 minutes. At the end of the training, a spelling test was again administered to both groups, following the relevant protocols related to phonological awareness. Finally, the obtained data were analyzed using the covariance method.

Results : Based on the results of the covariance test, a statistically significant difference was observed between the control and experimental groups. There was a significant statistical difference in the improvement of phonological awareness and spelling, particularly for multisyllabic words with more complex syllables, based on the cognitive training model ($p<0/001$).

Conclusion : Training based on the cognitive learning model leads to a significant improvement in phonological awareness and the spelling of words, especially more complex multisyllabic words in autistic children.

Keywords : Cognitive learning model, autistic children, phonological awareness, spelling.

Count: 320
Abstract ID: 649
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Exploring the Link Between Cognitive Flexibility and Facial Emotion Recognition in Autism Spectrum Disorder

Submission Author: Mohsen Sedaghatkish

Mohsen Sedaghatkish[1]

1. Institute for Cognitive Science Studies

Background and Aim : Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by challenges in social communication and repetitive behaviors. One core issue in individuals with ASD is difficulty in recognizing facial emotions, which plays a crucial role in social interactions. Additionally, individuals with ASD often exhibit deficits in cognitive flexibility, which refers to the ability to shift thinking or switch tasks. This study aims to investigate the correlation between facial emotion recognition and cognitive flexibility in individuals with ASD.

Methods : Participants The study included 50 individuals with ASD and 50 neurotypical (non-ASD) individuals matched by age, gender, and intelligence. The ASD group was selected based on diagnostic criteria and the ADOS-2 tool. Instruments 1. Facial Emotion Recognition Test: Participants were shown images displaying six basic emotions (happiness, sadness, fear, anger, surprise, disgust) and asked to identify the emotions. Accuracy and reaction time were recorded. 2. Cognitive Flexibility Test: The Wisconsin Card Sorting Test (WCST) was used to measure cognitive flexibility, focusing on perseverative errors as a key index. 3. Questionnaires: Participants completed self-report questionnaires, including the Social Responsiveness Scale (SRS) and the Repetitive Behavior Scale (RBS-R), to assess social difficulties and repetitive behaviors. Procedure Participants completed the facial emotion recognition test first, followed by the cognitive flexibility test. Afterward, they filled out the questionnaires. Data Analysis Pearson's correlation coefficient was used to assess the relationship between facial emotion recognition and cognitive flexibility. Group differences between the ASD and control groups were analyzed using t-tests.

Results : Group Comparisons 1. Facial Emotion Recognition: Individuals with ASD showed lower accuracy in recognizing emotions compared to the control group ($p < 0.01$), especially for emotions like fear and disgust. Their reaction times were also slower across all emotions ($p < 0.05$). 2. Cognitive Flexibility: Individuals with ASD made more perseverative errors on the WCST, indicating impaired cognitive flexibility ($p < 0.01$). Correlations A significant negative correlation was found between facial emotion recognition accuracy and perseverative errors in the ASD group ($r = -0.45$, $p < 0.01$). This suggests that those who had more difficulty recognizing emotions also had more cognitive flexibility challenges. The strongest correlation was observed between recognizing fear and cognitive flexibility ($r = -0.52$, $p < 0.01$).

Conclusion : The results indicate a significant correlation between facial emotion recognition and cognitive flexibility in individuals with ASD. This connection may point to shared neural mechanisms underlying both processes. Notably, difficulties in recognizing negative emotions such as fear and sadness were strongly associated with cognitive flexibility impairments. These findings may explain why individuals with ASD struggle in social interactions, as both processes are vital for social success. As a conclusion, this study highlights a meaningful relationship between facial emotion recognition and cognitive flexibility in individuals with ASD. The findings could inform the development of more targeted therapeutic programs aimed at improving both social and cognitive functioning in this population.

Keywords : Cognitive Flexibility; Facial Emotion Recognition; Autism Spectrum Disorder

Count: 321
Abstract ID: 274
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

A retrospective study of risperidone in children wirh autism spectrum disorder: comparison of Disruptive behavior and communication skills

Submission Author: Hoorieh Darvishi

Hoorieh Darvishi [1], Mohammad Rezaei[2], Mahsa Rajabian[3]

1. Institute for Cognitive Science Studies,Tehran,Iran
2. Hamadan University of Medical sciences, Autism Spectrum Disorder Research Center, Hamadan, Iran
3. Hamadan University of Medical sciences, Hamadan, Iran

Background and Aim : Autism is a neurodevelopmental disorder that has a growing trend in the prevalence of autism in the whole world. These children suffer from cognitive defects such as problems in eye contact, attention, memory, problem solving and decision making . Also, these people have behavioral problems such as stereotyped and repetitive behavior and challenging behaviors that these weaknesses lead to the isolation of these children and make even high-level children unable to communicate in social situations. Because of these problems, these children receive both rehabilitation interventions and drug treatments. In this retrospective study, we intend to compare the communication skills and repetitive behaviors in children with autism spectrum disorders (ASD) who used risperidone or other drugs.

Methods : In this study, 44 participants were involved (age of 4 to 13), who were divided into two groups: those who had received Risperidone and those who had not. Children with ASD were examined in a quiet room in the rehabilitation center of Tehran. repetitive behavior scale (RBS) and children communication checklist (CCC) used to evaluate their repetitive behavior and communication skills.

Results : The results of the study showed that there was no significant difference in repetitive behavioral scores between the two groups (p=0.125); however, a significant difference was observed in communication skills between the two groups (p=0.04), with the group using risperidone showing lower scores

Conclusion : Based on the results of this study, it seems that the use of risperidone affects the reduction of behavioral problems, but it does not bring about significant improvement in behavioral problems. The results of this study can help specialists related to this disorder to formulate a treatment plan

Keywords : Autism spectrum disorder ; communication ; medication ; disruptive behavior

Count: 322
Abstract ID: 56
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Impact of Demographic and Prenatal Factors During Pregnancy on Autism Risk in Children: Evidence from Golestan Province

Submission Author: Fatemeh EmamiPari

Fatemeh EmamiPari[1], Behnaz Bazrafshan[2], Morteza Jafari[3], MohamadReza Kalani[4]

1. Molecular Diagnostics Research Group, School Of Advanced Technology in Medicine, GOUMS, Gorgan, Iran
2. Student Research Committee, Faculty of Modern Medical Technologies, Golestan University of Medical Sciences, Gorgan, Iran
3. Master in Plant Biotechnology, Biotechnology Research Institute, Shiraz University, Iran
4. Enterprise-TTM, University of Pittsburgh Medical Center, Pittsburgh, USA

Background and Aim : Autism spectrum disorder (ASD) is a complex neurodevelopmental condition characterized by persistent difficulties in social communication and interaction, along with restricted, repetitive patterns of behavior, interests, or activities. The prevalence of ASD has been increasing globally, and identifying risk factors is crucial for early detection and intervention. This study aimed to investigate the influence of Demographic and Prenatal Factors During Pregnancy on the risk of ASD in children in Golestan Province, Iran in 2015.

Methods : Our cohort comprised a total of 150 children, ranging from 7 to 18 years of age, which included 36 children diagnosed with ASD and 114 typically developing control children. Data collection was carried out through an epidemiological assessment utilizing a structured questionnaire designed to capture a comprehensive range of demographic and prenatal factors during the mothers' pregnancies. The questionnaire was administered to collect retrospective data, which was then meticulously compared between the ASD and control groups. For the purpose of statistical analysis, the collected data underwent normalization processes to ensure comparability. Subsequent analyses were conducted using SPSS software, where we examined the potential association between ASD in children and various parental characteristics that were present before birth and during the pregnancy period. Additionally, we assessed the correlations among the different factors to elucidate their collective impact on the risk of developing ASD. The statistical methods employed included descriptive analysis to summarize the data, followed by inferential statistics to test for significant differences and associations between the groups. The level of significance was set at $P<0.05$ for all tests.

Results : In our study, we discovered that the risk of Autism Spectrum Disorder (ASD) in children is significantly associated with a range of factors ($P<0.05$). These include a family history of special diseases, maternal health conditions, the child's birth order, maternal use of medication for infections, stress during pregnancy, anemia treatment, infections during pregnancy, consanguineous marriages, a parental history of miscarriages, and the paternal

blood type. Additionally, our analysis revealed a significant correlation between some of the studied factors ($P<0.05$).

Conclusion : These findings highlight the critical need for early identification of these risk factors and the development of targeted interventions to improve the prognosis for children with ASD in Golestan Province, Iran. Further research is essential to unravel the biological pathways and to explore the interplay between genetic predispositions and environmental factors in the etiology of ASD.

Keywords : Autism Spectrum Disorder (ASD); Demographic ; Prenatal factors; Etiology of ASD; Infections during pregnancy

Count: 323
Abstract ID: 686
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Case Report of Childhood Disintegrative Disorder Triggered by Trauma: Diagnostic Challenges and Clinical Insights

Submission Author: Samin Davoody

Samin Davoody[1], Rozita Davari-Ashtiani[2], Maryam Abbasinjead[3]

1. Affiliation 1 : Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Affiliation 2: Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Psychiatry, Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Department of Psychiatry, Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background and Aim : Childhood Disintegrative Disorder (CDD) is a rare and poorly understood neurobehavioral condition classified under the autism spectrum disorders. It is characterized by a marked loss of previously acquired skills in language, social behavior, and adaptive functioning after a period of at least two years of normal development. Despite its classification within the autism spectrum, the etiology of CDD remains largely unknown. Diagnosis is challenging due to its rarity and overlapping features with other neurodevelopmental disorders. Diagnostic tools include detailed clinical history, neuropsychological assessments, and autism-specific rating scales such as the Childhood Autism Rating Scale, Second Edition (CARS2), and in some cases genomics tests.

Methods : We report the case of a 9-year-old girl who demonstrated normal development until the age of 4, exhibiting typical speech, social behavior, and physical milestones. Following a traumatic incident where she witnessed her mother and brother's self-immolation, the patient began to exhibit significant neuropsychiatric symptoms, such as social withdrawal and repetitive behaviors. Over the next three years, her condition progressively worsened. By the age of 7, she displayed core symptoms of autism spectrum disorder (ASD), including stereotypic behavior, loss of verbal skills and social impairment. The patient's marked regression was evident through her inability to perform tasks previously learned, such as writing the basic Persian alphabet, and total dependence on her older sister for daily activities.

Results : The diagnosis of CDD was confirmed using the CARS2 scale, where she scored 38, placing her in the "severely autistic" range, consistent with a CDD diagnosis. However, the recent neurological evaluations, electroencephalography (EEG) and magnetic resonance imaging (MRI), returned normal results. The patient was continued taking Aripiprazole 15 mg daily to manage mood instability. Only slight improvement was observed in her mood. The patient is being followed up regularly for over the course of a year eversince the CDD diagnosis

has been made. Despite ongoing symptomatic management, there has been no significant improvement in her cognitive or social abilities.

Conclusion : This case underscores the severity and progressive nature of CDD, particularly in the context of a traumatic trigger. Diagnostic evaluation relies on a thorough clinical history, exclusion of other neurological conditions and childhood onset schizophrenia and the use of autism-specific tools like CARS2 and ADOS. Due to the rarity of this disorder, further reporting of similar cases is essential to enhance early diagnosis and optimize management strategies. Clinicians should be alert to CDD's potential onset following psychological trauma to facilitate timely intervention.

Keywords : Childhood Disintegrative Disorder (CDD), Neuropsychiatric Regression, Autism Spectrum Disorder, Traumatic Event, CARS2 Diagnostic Tool

Count: 324
Abstract ID: 692
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

Potential of Limosilactobacillus reuteri in Modulating Neuroplasticity and Ameliorating Behavioral Deficits: Novel Insights on Mechanisms Underlying Gut-brain axis in a Rat Model of Autism

Submission Author: Samin Davoody

Samin Davoody[1], Monireh Mansouri[2], Hamidreza Houri[3]

1. Affiliation 1 : Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Affiliation 2: Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Shahid Beheshti University, Department of Cognitive Psychology, Institute For Cognitive And Brain Sciences, Tehran, Iran
3. Foodborne and Waterborne Diseases Research Center, Research Institute for Gastroenterology and Liver Diseases, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : An emerging hypothesis proposes that the gut-brain axis may play a crucial role in the pathophysiology of neurodevelopmental disorders such as autism spectrum disorder (ASD). A growing body of evidence suggests that probiotic Limosilactobacillus reuteri (LR) modulates various biological axes, including the gut-brain connection. This study determines whether L. reuteri administration can mitigate autism-related abnormalities in a maternal separation rat model of ASD and aims to determine the underlying mechanisms behind the axis.

Methods : Three groups of male Wistar rats were included: a maternal-separated reuteri-treated group (MS+LR), a maternal-separated placebo-treated group (MS), and a non-separated control group. Behavioral assessments, including the three-chamber, marble-burying, and open-field tests, were conducted to measure social interaction, repetitive behaviors, and anxiety respectively. Using immunohistochemistry and fluorescent microscopy imaging of the hypothalamic paraventricular nucleus (PVN), oxytocin expression was assessed, and neuroplasticity of the infra-limbic (IL) and anterior cingulate cortex (ACC) was examined using a 3D stereological analysis of the medial prefrontal cortex (mPFC). Acquired images were analyzed by CellPose, novel robust deep-learning-based cell segmentation tool. Absolute Quantification of Fecal L. reuteri was conducted by Quantitative Real-Time PCR.

Results : In the MS+LR group, there was significantly higher L. reuteri colonization than the MS and control groups. In behavioral tests, L. reuteri was found to improve social behavior and lessen repetitive behavior compared to MS. Immunohistochemical results showed normalized expression of oxytocin in PVNs of the MS+LR group, indicating an underlying neurological mechanism. Additionally, the IL volume and number of neurons in IL in the MS+LR group was significantly decreased compared to the MS group in which they were increased in comparison to the control group ($p < 0.05$), the ACC volume and number of

neurons in the region were significantly decreased in MS group compared to control group which were modulated in MS+LR group.

Conclusion : This study suggests that Limosilactobacillus reuteri may alleviate ASD-like symptoms triggered by maternal separation, promoting neuroplasticity via oxytocin-dependent pathways in male rats.

Keywords : Lactobacillus reuteri, Autism, Gut-brain axis, Oxytocin, Animal model, Fluorescent Microscopy, Deep-learning

Count: 325
Abstract ID: 46
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Neurofeedback as a Treatment Intervention in attention deficit hyperactivity disorder: a systematic review

Submission Author: MohammadTaha Rostami

MohammadTaha Rostami[1], Sanay Mostofi[2]

1. Student research committee, Tabriz university of medical sciences, Tabriz, Iran.
2. bachelor of occupational therapy from Tabriz University of medical science

Conclusion : Recent years have witnessed a renewed interest in neurofeedback in response to the lack of long-term effects for both medication and behavioral therapy and the side effects of medication. Herein, we provide evidence for the efficacy and specificity of standard neurofeedback protocols: theta/beta, sensorimotor rhythm, and slow cortical potential. In line with the guidelines for rating evidence developed by the APA, “standard” neurofeedback protocols have been considered “Efficacious and Specific, Level V” in treating ADHD.

Keywords : Neurofeedback. ADHD . EEG biofeedback

Count: 326
Abstract ID: 54
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Status of circadian rhythm preferences and working memory performance in adults with symptoms of attention-deficit/hyperactivity disorder: a review

Submission Author: Mahsa Pournemat

Mahsa Pournemat[1], Mohammad Narimani[2]

1. Master's student in General Psychology, Faculty of Educational Sciences and Psychology, Department of Psychology, Mohaghegh Ardabili University, Ardabil, Iran
2. Professor, Faculty of Educational Sciences and Psychology, Department of Psychology, Mohaghegh Ardabili University, Ardabil, Iran

Conclusion : Abstract: One of the disorders that begins in childhood and may persist into adolescence and adulthood is Attention Deficit Hyperactivity Disorder (ADHD), which can be exacerbated by various factors affecting an individual's daily life. This study aims to review previous research on circadian preferences and working memory performance among adults with ADHD symptoms. The core feature of ADHD is a persistent pattern of inattention and/or hyperactivity-impulsivity that disrupts the individual's functioning or development, creating limitations for the person. Factors such as circadian rhythm (sleep-wake cycles and activity) may exacerbate ADHD symptoms. This rhythm is endogenously managed by the brain's biological clock and is in cycles that repeat approximately every 23 to 25 hours. Many adults with ADHD tend to have an evening preference and experience issues like delayed sleep phase, difficulty falling asleep and waking up, and poor sleep quality, which are related to their preferred circadian rhythm. Additionally, ADHD in adults is associated with deficits in cognitive processes such as attention, concentration, planning, and information processing. It has also been reported that individuals with ADHD may have significant problems with higher cognitive functions, including working memory That finally experiences more difficulties in academic and occupational domains compared to individuals with normal executive functions. According to existing research, there are differences in the neural processing of working memory in adults with who perform relatively worse than non-ADHD adults in both domains of working memory (visual-spatial perception/phonological loop). Furthermore, the working memory issues in individuals with ADHD are more related to deficits in central executive functions rather than weaknesses in storing information in a specific domain. the Evening rhythm also in adults with ADHD is related to issues with maintaining arousal and sustained attention, as well as differentiating between target and non-target stimuli.

Keywords : Adult ADHD; circadian rhythm; working memory; attention-deficit/hyperactivity

Count: 327
Abstract ID: 157
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Vitamin D Maintains Offspring Cognitive Abilities in a Model of Mild Maternal Hypothyroidism

Submission Author: Hanieh Hajipour

Hanieh Hajipour[1], Katayoun Sedaghat[2]

1. Research Center for Physiology, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran
2. Research Center for Physiology, Department of Physiology, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran

Background and Aim : Aim: Thyroid hormones (TH) are critical for normal central nervous system development during fetal or neonatal periods. TH regulate neuronal myelination, dendrite proliferation, neurogenesis, and synapsis in early developmental periods. Since the availability of T4 to the fetal brain depends on the maternal levels of free T4, maternal hypothyroidism will severely impair this supply. Offspring from a mother with even mild TH insufficiency during pregnancy show cognitive impairments. Vitamin D as an internal hormone plays critical role in neurobiological processes and its receptors are widely distributed in brain; including cerebral cortex, hippocampus, amygdala and other nuclei. Vitamin D exerts neuroprotective, anti-inflammatory, and antioxidant effect on neurons and increase the production of neurotrophic factors, which promote the survival of both hippocampal and cortical neurons. Based on vitamin D's protective role in the brain, the aim of this study was to investigate if this vitamin might exert its protection on the under the developmental fetus brain of hypothyroid mother.

Methods : Methods: Female Wistar rats received Propylthiorusil (PTU) 100mg/L of drinking water from the day 6th of gestation until delivery. Two other groups received PTU along with vitamin D (5 and 10 μg/kg, IP) treatment, twice weekly, until delivery (offspring Group1). Euthyroid mother received no PTU or vitamin D treatment (offspring Euthyroid group). The offspring of hypothyroid dam were divided into two groups; those that received vitamin D (5 or 10 μg/kg) immediately after birth till the day 60th post-natal (offspring Group 2) and another that received no treatment (offspring Hypothyroid group). On the day 60 post-natal, the offspring cognitive ability was tested by Novel Object Recognition paradigm (NOR). A day later blood sample were taken for T4 measurement. Then they sacrificed, hippocampus was dissected and underwent for protein assay (ELISA) for pro-inflammatory factors Tumor necrosis factor-alpha (TNF-alpha) and Interleukin-6 (IL-6); Brain derived neurotrophic factor (BDNF); oxidative marker Malondialdehyde (MDA) and anti-oxidative enzyme Super oxide dismutase (SOD).

Results : Results: T4 levels were significantly low in hypothyroid mothers, while it was at a normal level in all offspring. In NOR, Hypothyroid group displayed significant lower Preference index relative to Euthyroid, while vitamin D in Group 1, raised the Preference Index significantly higher than Hypothyroid (P<0.05, P<0.01, respectively for 5 and 10??g/kg). Pro-inflammatory cytokines TNF-alpha and IL-6 and oxidative marker MDA showed marked raise in Hypothyroid relative to Euthyroid, while, in both Groups1 and 2 they showed marked decline relative to Hypothyroid (P<0.0001). On the contrary, BDNF and anti-oxidative enzyme SOD displayed significant decrease in Hypothyroid relative to Euthyroid, while vitamin D in both Groups1 and 2 markedly increase both factors relative to Hypothyroid (P< and even Group1 showed significantly higher increase than Group2 (P<0.01).

Conclusion : Conclusion: In maternal hypothyroidism vitamin D administration during gestation may help to reduce the pro-inflammatory and oxidative factors, whereas raise neurotrophic and anti-oxidative agents. This study indicates that receiving vitamin D as supplement during pregnancy in mothers with mild hypothyroidism may help to maintain almost normal brain development and cognitive function later in post-natal and adulthood life.

Keywords : Vitamin D; Maternal Hypothyroidism; Anti-inflammatory; Anti-oxidative; BDNF

Count: 328
Abstract ID: 112
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Effects of Non-Invasive Brain Stimulation on Autism Spectrum Disorder: A Systematic Review

Submission Author: Darya Jahedi Gholenji

Darya Jahedi Gholenji[1], Mohammad Taha Rostami[2]

1. Student research committee, Tabriz university of medical sciences, Tabriz, Iran.
2. Student research committee, Tabriz university of medical sciences, Tabriz, Iran.

Conclusion : studies point to NIBS as a promising intervention for the reduction of ASD symptoms, as well as for improving neuropsychological functions in this population. Following NIBS a significant improvement in socialization, repetitive behaviors, theory of mind, sensory and cognitive awareness, language skills, working memory, behavioral problems, sleep and emotion regulation strategies was achieved by increasing cerebral blood flow in brain regions and neuroplasticity-related changes; therefore, NIBS is a safe therapeutic tool for core autistic symptoms.

Keywords : Autism Spectrum Disorder; Non-invasive brain stimulation (NIBS); transcranial magnetic stimulation (TMS); transcranial direct current stimulation (tDCS)

Count: 329
Abstract ID: 546
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Oral

The Therapeutic Potential of Plumbagin in Mitigating Behavioral Dysfunctions and Neuroinflammation in a Valproic Acid-Induced Autism Model

Submission Author: Hamid Askari

Hamid Askari[1], Maryam Ghasemi Kasman [2]

1. Research Committee, Babol University of Medical Sciences, Babol, Iran
2. Department of Physiology, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Neuroinflammation and immune dysfunction are critical factors in the development of autism spectrum disorder (ASD), necessitating the exploration of novel therapeutic agents. Plumbagin (PL), a neuroprotective and anti-inflammatory quinone, has shown promise in ameliorating behavioral dysfunctions and neurodegenerative diseases. This study investigates the effects of PL on cognitive functions, social interaction, neuro-morphological alterations, and inflammation levels in a valproic acid (VPA)-induced autism model

Methods : Twelve female and six male adult albino Wistar rats (200-250 g) were obtained from the animal house of Babol University of Medical Sciences (Babol, Iran). The reproductive cycle of each female rat was determined by the vaginal smear method, followed by overnight mating (2:1). The autism model was established by administering a single intraperitoneal injection (i.p.) of VPA (600 mg/kg) to pregnant rats on the 12.5th day of gestation. The offspring were kept with their mothers until the end of lactation (postnatal day (PND) 21) and treated from PND 7 to PND 35 (adolescence) in the following groups: control (vehicle), VPA-treated, VPA plus PL-treated (0.25, 0.5, or 1 mg/kg), and VPA plus Celecoxib (CCB, 15 mg/kg) as a comparative treatment. Spatial learning and memory were evaluated using the Morris water maze (MWM) test from PND 30 to 34. Social interaction and preference were assessed using the three-chamber test on PND 35. Nissl staining was performed to count dark cells in the CA1, CA3, and DG regions of the hippocampus. Hematoxylin and eosin staining were conducted to examine neuro-morphological alterations in the hippocampus. Immunostaining against glial fibrillary acidic protein (GFAP) was used as an astrocyte marker. Pro-inflammatory cytokine levels (IL-6, TNF-α, IL-1β, and GAPDH) were quantified using real-time PCR. Data are expressed as mean ± S.E.M. and analyzed with GraphPad Prism (version 6 software, La Jolla, CA, USA). Normality of data distribution was checked using Kolmogorov-Smirnov and Shapiro-Wilk tests. Repeated measures ANOVA was used for MWM and three-chamber tests. One-way ANOVA followed by Tukey post hoc test was used for the probe test, SI, SPI, and real-time PCR results. Histological data and immunostaining were analyzed using Kruskal-Wallis followed by Dunn's post-test. A significance level of $p < 0.05$ was considered statistically significant.

Results : PL treatment significantly alleviated social deficits and enhanced spatial learning and memory in VPA-exposed rats ($F(1.955, 9.777) = 15.52$, $p = 0.0010$). Additionally, there were reductions in the number of hippocampal dark cells (CA1, CA3, and DG; $p < 0.0001$ vs. vehicle), astrocyte activation (CA1: $p = 0.0001$ vs. vehicle; CA3: $p = 0.001$ vs. vehicle; DG: $p = 0.001$ vs. vehicle), and pro-inflammatory cytokines IL-1β ($F(5, 18) = 8.057$; $p = 0.0005$) and IL-6 ($F(5, 18) = 3.906$; $p = 0.02$). No significant changes were observed in TNF-α expression ($F(5, 18) = 1.561$; $p = 0.2$).

Conclusion : These results suggest that PL mitigates VPA-induced behavioral dysfunctions by reducing hippocampal inflammation, underscoring its potential as a therapeutic agent for ASD.

Keywords : Autism, Plumbagin, Neuroinflammation, Cognitive Function

Count: 330
Abstract ID: 467
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

The Impact of Understanding Autism Disorder on Educational Models for Students: A Review Study

Submission Author: Mahdi HedayatiRezvani

Mahdi HedayatiRezvani[1], Dr. Maryam Mahdavi[2]

1. Counseling Specialist, Ministry of Education, Tehran, Iran
2. Visiting Assistant Professor, Farhangian University, Tehran, Iran

Conclusion : Autism spectrum disorder (ASD) is one of the most common neurodevelopmental disorders of childhood and is characterized by impaired normal development in communication, social interaction, and restricted behavior; however, such development may be within normal limits, when regarded in the context of an individual's culture and environment. The current trend of increasing numbers of students with autism in mainstream classes require teachers to create an inclusive educational environment without much or any support in how to do so. The growing prevalence of autism of course is a phenomenon. This study seeks to increase awareness and understanding of the complexities of autism, while offering research based strategies and resources that directly support afflicted individuals and their families. Additionally, it attempts to identify alternative proven instruction best practices and teacher preparation. In addition, these findings are relevant to general and special education teachers, as well as related service personnel who work together, serve, and communicate in daily inclusive educational settings.

Keywords : Autism Spectrum Disorder; Autistic students; Impact of understanding autism

Count: 331
Abstract ID: 395
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Evaluating the effects of cuminaldehyde on autistic-like behaviors in mouse model of maternal separation: possible effects on expression of HMGB1

Submission Author: Alireza Gholipour

Alireza Gholipour[1], Hossein Amini-Khoei[2], Fariba Houshmand[3], Elham Soghaei[4]

1. Clinical Research Development Unit, Ayatollah Kashani Hospital,Shahrekord University of Medical Sciences, Shahrekord, Iran
2. Medical Plants Research Center, Institute of Basic Health Sciences, Shahrekord University of Medical Sciences, Shahrekord, Iran
3. Faculty of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran
4. Faculty of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran

Background and Aim : Autism spectrum disorder (ASD) is a neurodevelopmental disorder that appears in the first years of life. The cause of this disorder remains unknown although immunological, genetic, biological and psycho-social theories have been proposed for it. Separation from the mother is one of the psychosocial causes affecting the occurrence of this disease. The immune system and the production of cytokines also may contribute substantially to the pathogenesis of the disorder. The role of medicinal plants with neuroprotective effects in autism has been reported. One of these plants is cumin which is rich in cuminaldehyde.Cuminaldehyde, which has anti-inflammatory, antioxidant and antimicrobial effects, can be considered as a natural effective compound for the treatment of autism. This study aimed to investigate the therapeutic effect of cuminaldehyde on autism-like behavior in mice separated from the mother with respect to its potential anti-neuroinflammatory effects.

Methods : In this experimental study, separation from the mother was used and the pseudo-autistic behaviors of mice were investigated. Forty male NMRI mice were randomly divided into 5 groups of unstressed mice receiving normal saline and with maternal separation anxiety receiving normal saline and cuminaldehyde at 5, 25, 50 mg/kg. Intraperitoneal injections were performed for 14 days. The behaviors of mice were studied using three-chamber sociability tests, the resident-intruder test, and shuttle box tests. Expression of NLRP3, TLR4, HMGB and IL-1β genes in the hippocampus was investigated by real-time PCR and data analysis was done using Prism software.

Results : Maternal separation caused autism-like behaviors in mice. Treatment of mice separated from the mother with cuminaldehyde significantly increased the duration and number of sociability times in the three-chamber sociability test. It also reduced the duration of violent behavior in the resident-intruder test and the duration of the secondary delay in the shuttle box

test. As well, cuminaldehyde reduced the expression of genes related to inflammatory factors TLR4, HMGB1, IL-1β and NLRP3 compared to the group separated from the mother.

Conclusion : The administration of cuminaldehyde, through its anti-inflammatory properties, improved the symptoms of disorders caused by autism-like behaviors, and it can be recommended as a complementary medicine for the treatment of autism after further studies.

Keywords : Autism; Maternal separation anxiety; Mouse; Cuminaldehyde

Count: 332
Abstract ID: 390
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Evaluating the effect of maternal separation stress on the development of autism spectrum disease-like behaviors in the mouse: possible involvement of neuroinflammation and HMGB1 protein

Submission Author: Vahid ReisiVanani

Vahid ReisiVanani[1], Zahra Lorigooini[2], Elham Bijad[3], Hossein Amini-Khoei[4]

1. Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran
2. Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran
3. Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran
4. Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran

Background and Aim : Autism Spectrum Disorder (ASD) is a neurodegenerative disorder with the highest prevalence worldwide. Neuro-immune system responses from prenatal stages to adulthood cause developmental, synaptic signaling, neurotransmitter balance disturbance, and structural changes in the brain, especially in the hippocampus and amygdala. This study aimed to investigate the effect of maternal separation (MS) in developing ASD symptoms in mice, considering the possible role of neuroinflammatory response in the hippocampus.

Methods : In this experimental study, 48 mice were randomly assigned to MS and control groups. In the intervention group, mice were separated from their mothers for 3 hours daily from the second to the fourteenth day after birth. Then, autistic-like behaviors were investigated with related behavioral tests, including the three-chamber sociability test, morris water maze, shuttle box, resident-intruder test, and marble burying test. After behavioral evaluations, the level of brain nitric oxide, malondialdehyde, and antioxidant capacity was evaluated by biochemical tests, and gene expression of hippocampal inflammatory mediators, including TNF-α, IL-1β, TLR4, HMGB1, and NLRP3, was assessed with RT-PCR.

Results : The results showed that MS stress leads to disruption in social interactions ($P < 0.01$), learning and visuospatial and avoidance memory ($P < 0.01$, $P < 0.05$), and the occurrence of repetitive and obsessive-like behaviors ($P < 0.05$) in mice. In this study, the serum malondialdehyde level in the MS group was significantly higher than the control group ($P < 0.01$). Meanwhile, no significant difference was observed between the antioxidant capacity, nitric oxide, and malondialdehyde levels in the brain of the studied groups ($P=0.50$, $P=0.20$, $P=0.15$). Finally, the investigation of hippocampal inflammatory genes showed that TNF-α, IL-1β, TLR4, and HMGB1 were significantly expressed more in the MS group ($P < 0.05$, $P <$

0.05, P < 0.01, P < 0.01). Although the NLRP3 inflammasome gene expression level was higher in the MS group, this difference was not statistically significant (P=0.15).

Conclusion : The present study showed that the stress of separation from the mother in early life leads to autistic-like behaviors, including social interaction disturbance, repetitive and obsessive-like behaviors, and learning and memory disturbance. In addition, the increased expression of hippocampal inflammatory mediators showed that MS probably plays a role in the occurrence of autistic-like behaviors in mice through the activation of the HMGB1/TLR4 signaling cascade.

Keywords : Maternal separation; Autism spectrum disease; Mice; HMGB1/TLR4 signaling pathway

Count: 333
Abstract ID: 336
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Oxytocin can ameliorate social deficits induced by excessive audio-visual exposure in rats

Submission Author: Mozhan Parsa

Mozhan Parsa[1], Monireh Mansouri[2], Hamidreza Pouretemad[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. Department of Psychology, Shahid Beheshti University, Tehran, Iran

Background and Aim : Recent research has suggested that excessive exposure to screens during critical periods of brain development may act as a contributing factor to social deficits in children in a manner similar to autistic behaviors. However, the specific mechanisms and long-term effects are not fully understood. The present study investigates the effect of oxytocin as an effective neuropeptide in social behavior on the behavioral impairments induced by excessive audio-visual stimulation (EAVS) which already is demonstrated in our previous study as an animal model of digital screen exposure.
Methods : Neonatal rats were exposed to EAVS during early development, from PND 10 to 35. The rats were then divided into three groups: the saline-treated control group, the saline-treated EAVS group, and the EAVS group treated intranasally with 0.8 IU/kg oxytocin from PND 21 to PND 35. Behavioral tests were subsequently conducted to examine social interaction, repetitive behavior, locomotor activity, and anxiety-like behaviors in PND 50 to 55. Blood cortisol levels were measured by enzyme-linked immunosorbent assay (ELISA) to evaluate the validity of the hypothesis of non-stressfulness of the sensory stimulation paradigm.
Results : Rats exposed to EAVS demonstrated hyperactivity and significant deficiencies in social interaction, which were ameliorated by oxytocin. These behavioral abnormalities resemble some characteristics of autism spectrum disorders (ASD).
Conclusion : Social deficits of ASD-like behaviors in rats could be induced by excessive audiovisual exposure during the early developmental stages. Intranasal oxytocin treatment effectively reversed these behavioral and structural alterations, which may indicate a future therapeutic strategy in the context of ASD-related social impairments. This paper shows the highly vulnerable developing brain affected by environmental factors, one of which is screen exposure, and points out the promising role of oxytocin in treating social impairments. Further studies are needed concerning the neurobiological process of oxytocin and its clinical use in ASD social impairments treatment.
Keywords : Autism; oxytocin (OXT); excessive audio-visual stimulation (EAVS); digital devices; social behavior

Count: 334
Abstract ID: 360
subject: Development: Neurodevelopmental Disorder (ADHD, Autism, Learning Disorders)
Presentation Type: Poster

Comparative Analysis of Genetic and Environmental Models of Autism in Rats: Implications for Future Research Using Brain Organoids

Submission Author: Mozhan Parsa

Mozhan Parsa[1], Monireh Mansouri[2], Hamidreza Pouretemad[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. Department of Psychology, Shahid Beheshti University, Tehran, Iran

Background and Aim : Autism Spectrum Disorder, or ASD, is a neurodevelopmental brain disorder that has patterns of deficits in social interaction and restrictive repetitive behaviors. Genetic models explain some aspects of the etiology of autism, but increasingly, environmental factors are recognized to play an important role. The current study will compare various rat models of autism, focusing on genetic predisposition, maternal separation, exposure to VPA, and extreme audio-visual stimulation. We will review the behavioral outcomes of these models in the hope of determining the mechanisms underlying social behavior deficits and repetitive behaviors that are the hallmark symptoms of ASD.

Methods : In this study, a total of four rat model groups were used, including a genetic autism model of Shank3 knockout, maternal separation at an early stage of development, in utero VPA exposure, and extremely audiovisual stimulated groups. Behavioral tests included standardized tests of the three-chamber social interaction test for social behaviors and the marble burying test for repetitive behaviors. Various models were compared in light of their behavioral outcomes, and statistical analyses were performed accordingly.

Results : These results revealed significant differences in social behavior deficits and repetitive behaviors among the four groups: Shank3 knockout rats exhibited severe social withdrawal and significantly enhanced repetitive grooming behaviors; maternal separation-exposed rats showed marked social deficits and increased anxiety-like behaviors. Therefore, VPA-exposed rats presented severe impairments in social interaction and enhanced repetitive behaviors as compared to controls. On the contrary, rats reared under very strong audio-visual stimulation presented mild social deficits without significantly increasing repetitive behaviors. These results confirm the fact that genetic or environmental factors unequally influence the development of symptoms of autism in rat models.

Conclusion : Parallel comparison of these methods emphasizes that modeling autism by genetic and environmental influences, both are important. Each produced different behavioral phenotypes that added to the knowledge of the multifaceted nature of ASDs. Results indicate

that genetic models suggest the inherited basis of autism, while environmental manipulations such as maternal separation and VPA exposure yield complementary, indeed critical information regarding neurodevelopmental processes. In this context, we suggest that brain organoid models may thus form a very promising direction for future research in the simulation of autism. Organoids will enable more accurate approximations of human neural development and cellular or molecular mechanisms of ASD. Knowledge from animal models and advanced organoid-based systems will be combined for an enhanced knowledge of the etiology of autism and a more accentuated intervention against it.

Keywords : Autism; genetic models; environmental factors; rat models; etiology of autism

Count: 335
Abstract ID: 268
subject: Development: Other
Presentation Type: Poster

Gene therapy in neuroscience

Submission Author: Reza Tirgar Fakheri

Reza Tirgar Fakheri[1], Kimia tanoorsaz[2], Negar khaki[3]

1. General medicine international university
2. General medicine international university
3. General medicine international university and cellular and molecular biology Azad university

Conclusion : Moreover, the rapid development of gene therapy presents a promising frontier in neuroscience, particularly for neurodegenerative diseases (NDDs). Recent advances in gene editing technologies, such as CRISPR/Cas9, have revolutionized the way researchers approach the genetic basis of these disorders. By enabling precise modifications to DNA, these tools not only facilitate the identification of genetic mutations linked to NDDs but also pave the way for innovative therapeutic strategies tailored to individual patients (Xiao-lin Zhu et al., 2021). As researchers uncover complex genetic interactions, the potential to design personalized gene therapies becomes increasingly feasible, enhancing treatment efficacy. This shift towards targeted interventions is expected to significantly improve patient outcomes and minimize the risk of adverse effects associated with broader treatment approaches.

Keywords : Gene therapy.Neuroscience

Count: 336
Abstract ID: 575
subject: Development: Other
Presentation Type: Poster

Advances in stem cell therapy in neurodegenerative diseases

Submission Author: Elham Zare

Elham Zare[1], Somaye Hesami[2], Seyed Sajjad Alavi Kakhki[3]

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

Conclusion : Introduction: Neurodegenerative diseases, such as Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis (ALS), represent a significant health challenge due to their progressive nature and lack of effective treatments. Recent advances in stem cell therapy have opened new avenues for potential interventions, leveraging the unique regenerative properties of stem cells to repair damaged neural tissues, restore function, and ultimately slow disease progression. This review synthesizes current research on stem cell therapies for neurodegenerative diseases, highlighting innovative approaches and emerging trends in this rapidly evolving field. Materials and Methods: A systematic literature review was conducted using databases including PubMed, Scopus, and Web of Science, focusing on articles published from 2010 to 2023. Search terms included "stem cell therapy," "neurodegenerative diseases," "Alzheimer's," "Parkinson's," and "clinical trials." Inclusion criteria were applied to select studies that reported on various types of stem cells (embryonic, adult, and induced pluripotent stem cells) and their therapeutic applications in neurodegeneration. A total of 45 relevant studies were analyzed for insights into efficacy, mechanisms of action, and clinical outcomes. Results: The analysis revealed that stem cell therapy has shown promise in preclinical and early clinical trials for a variety of neurodegenerative diseases. Strategies utilizing mesenchymal stem cells (MSCs) and induced pluripotent stem cells (iPSCs) have been associated with neuroprotection, modulation of neuroinflammatory responses, and potential restoration of lost neural function. In Parkinson's disease, grafting dopaminergic neurons derived from iPSCs has demonstrated significant improvements in motor functions in animal models, while early trials in Alzheimer’s disease indicate possible cognitive improvements and reduced amyloid plaque burden following MSC treatments. Discussion: Despite the promising outcomes, several challenges remain in the field of stem cell therapy for neurodegenerative diseases. These include concerns regarding the immunogenicity of transplanted cells, ethical considerations surrounding stem cell sources, and the need for rigorous, standardized protocols for cell preparation and delivery. Additionally, the heterogeneity of neurodegenerative diseases complicates the development of one-size-fits-all solutions. Ongoing research should prioritize resolving these issues, enhancing our understanding of the mechanisms through which stem cells exert their effects, and identifying appropriate patient populations for specific therapies. Conclusion: Advancements in stem cell therapy hold great potential for the treatment of neurodegenerative diseases, offering innovative strategies to repair and regenerate neural tissues. While significant progress has been made, further research is essential to optimize therapeutic approaches, ensure safety, and

evaluate long-term efficacy. The integration of multidisciplinary efforts encompassing cellular biology, neurology, and clinical research will be crucial in translating these advancements into effective treatments for patients suffering from neurodegenerative disorders.

Keywords : Stem cell therapy, Neurodegenerative diseases, Alzheimer, Parkinson, clinical trials

Count: 337
Abstract ID: 510
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Poster

Effects of different patterns of morphine exposure during adolescence on inflammatory pain behaviors

Submission Author: Fatemeh Jalali

Fatemeh Jalali[1], Kawsar Alami[2], Rana Shahabi[3], Saeed Semnanian[4], Hossein Azizi[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. Institute for Brain and Cognition, Tarbiat Modares University, Tehran, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
5. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : Pain is a sensory experience that serves as an unpleasant emotion, informing the body of real or potential tissue damage. This essential experience is designed to protect the body from further damage. Pain can be classified into three different forms: nociceptive, neuropathic, and inflammatory. In inflammatory pain, inflammatory mediators play a role in the sensitization of pain receptors, rendering their control crucial for alleviating the physical, psychological, and social impact on individuals. Notably, opioid abuse can significantly affect pain perception, and its prevalence is a significant concern during the sensitive period of adolescence. The ongoing brain development during adolescence makes people prone to the adverse effects of these substances. This study aims to investigate the effects of different patterns of morphine exposure during adolescence on inflammatory pain behaviors in adult rats, providing valuable insights into the long-term consequences of opioids on pain modulation.

Methods : Male adolescent Wistar rats were divided into three groups with different durations of morphine exposure and a control group receiving saline. The exposure periods were as follows: The acute morphine group received morphine for a single day on postnatal day (PND) 28, the sub-chronic morphine group received escalating doses of morphine from PND 28 to 32, and the chronic morphine group received escalating doses of morphine from PND 28 to 37. A control group received saline instead of morphine. After the administration of morphine, all rats underwent a drug-free period and were kept under normal conditions in their cages until they reached adulthood. Between PND 68 and 70, the rats were subjected to a formalin test to assess their response to inflammatory pain.

Results : The findings indicate that rats that received chronic and sub-chronic morphine showed higher nociceptive scores than the control group during adulthood. In contrast, acute morphine administration during adolescence did not significantly influence pain levels in adulthood.

Conclusion : Prolonged exposure to morphine during adolescence may lead to hypersensitivity to pain in later life, with the duration of morphine exposure during adolescence having varying effects on the rats' response to inflammatory pain in adulthood.

Keywords : Inflammatory pain; Formalin; Morphine; Adolescence

Count: 338
Abstract ID: 76
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Oral

Positive Impact of Metformin on Reducing Tolerance to the Analgesic Effects of Sodium Salicylate in Male Rats

Submission Author: Masoumeh Gholami

Masoumeh Gholami[1], Nastran Roshd Rashidi[2]

1. Department of Physiology, School of Medicine, Arak University of Medical Sciences, Arak, Iran
2. Department of Physiology, School of Medicine, Arak University of Medical Sciences, Arak, Iran

Background and Aim : Developing tolerance to the analgesic effects of opioids and non-steroidal anti-inflammatory drugs (NSAIDs) poses significant challenges in pain management. Identifying new pharmacological approaches for sustained therapeutic benefits is crucial. Metformin, a biguanide drug, shows promise in neuroprotection and may help mitigate opioid tolerance in chronic pain treatment. It is suggested that the endogenous opioid system mediates analgesic tolerance to NSAIDs. Given the observed cross-tolerance between NSAIDs, particularly sodium salicylate (SS), and opioids like morphine, this study aimed to determine if metformin could lessen the tolerance to sodium salicylate's anti-nociceptive effects.

Methods : The study involved fifty-six male Wistar rats (200–250 g). sodium salicylate (300 mg/kg) was administered intraperitoneally over seven days to induce tolerance. During this period, the rats received metformin at 50, 75, or 100 mg/kg doses for seven days to assess tolerance development to sodium salicylate's analgesic effects. The hot plate test was employed to measure the anti-nociceptive properties of the treatments.

Results : The administration of salicylate notably increased hot plate latency compared to the control group, with the combined treatment of SS and metformin at 50 mg/kg showing a stronger analgesic effect than SS alone. Additionally, this combination exhibited reduced analgesic tolerance over time.

Conclusion : The findings suggest that metformin effectively diminishes the analgesic tolerance induced by repeated intraperitoneal sodium salicylate injections in Wistar rats.

Keywords : Analgesic Effect; Non-Steroidal Anti-Inflammatory Agents; Drug Tolerance; Metformin; Pain; Sodium Salicylate; Rats.

Count: 339
Abstract ID: 545
subject: Pain and Sensory Systems: Tactile, Somatosensation and Pain Syndromes
Presentation Type: Oral

Neuralgia and Hippocampal Synaptic Plasticity in Adult Rats Following Adolescent Morphine Exposure

Submission Author: Kawsar Alami

Kawsar Alami[1], Yaghoub Fathollahi[2], Hossein Azizi[3], Saeed Semnanian[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 : Neuropathic pain is a debilitating condition that significantly impairs quality of life and places a substantial burden on society. It is characterized by a lesion or disease of the somatosensory nervous system that leads to impaired pain signal transmission and hypersensitivity. While nerve sensitization is often localized at the site of injury, nociplastic pain can persist and contribute to chronic pain. Aberrant synaptic plasticity in the hippocampus, a key region for memory functions, plays an important role in the processing, consolidation, and recurrence of chronic pain. Substance use, particularly during adolescence, can have a profound effect on the developing brain, leading to long-term changes in synaptic plasticity and behavior. This study aims to investigate the effect of adolescent morphine exposure on pain sensitivity and hippocampal nociplasticity in adult rats.

Methods : Adolescent rats were administered increasing doses of morphine from postnatal days (PND) 28 to 37. After one-month washout period, a chronic constrictive injury (CCI) model was utilized to induce neuropathic pain. Pain sensitivity to mechanical stimuli was assessed using the von Frey test, while thermal sensitivity was evaluated with the Hargreaves test. Baseline pain thresholds were evaluated one day before CCI surgery, and subsequent evaluations were performed seven days after the surgery. In addition, synaptic plasticity in the Schaffer CA1 region of the hippocampus was examined through in vitro field potential recordings, also performed seven days after CCI surgery.

Results : The findings showed that adolescent morphine exposure significantly lowered the 50% threshold (indicative of mechanical allodynia) and paw withdrawal latency (indicative of thermal hyperalgesia) in both baseline and neuropathic pain conditions. Furthermore, in neuropathic rats that had received morphine during adolescence, baseline synaptic responsiveness, short-term plasticity, and long-term potentiation (LTP) were all significantly impaired, highlighting the lasting effect of early morphine exposure on synaptic function and pain sensitivity.

Conclusion : This study provides compelling evidence that adolescent exposure to morphine increases pain sensitivity, and induces maladaptive changes in pain processing that can persist

into adulthood. This leads to significant impairments in synaptic plasticity in the hippocampus. These findings underscore the need for more research on the long-term consequences of substance use during critical developmental periods, and they highlight potential targets for interventions aimed at reducing the impact of early drug exposure on pain perception.

Keywords : Opioid; Pain threshold; Hippocampus; Synaptic plasticity; Adolescence

Count: 340
Abstract ID: 49
subject: Pain and Sensory Systems: Vision
Presentation Type: Poster

Serotonergic Modulation of Visual Processing: A Review Study

Submission Author: Sahar Noursina

Sahar Noursina[1], Amir-Hossein Darvish[2], Ardeshir Nabizadeh Zolpirani[3], Mir-Shahram Safari[4]

1. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran 19615-1178, Iran.
2. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran 19615-1178, Iran.
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran 19615-1178, Iran.
4. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran 19615-1178, Iran.

Conclusion : Introduction: Serotonin modulates sensory systems in a complex and context-specific manner, affecting various sensory modalities differently. Different serotonin receptors (e.g., 5-HT1A, 5-HT2A) have distinct roles in modulating sensory responses, with some receptors enhancing and others suppressing activity. Serotonergic neurons both influence and are influenced by sensory circuits, allowing for dynamic modulation based on sensory inputs and internal states. In this article we explore the effects of serotonergic modulation on visual processing. Method: Findings of this review extracted from 144 articles by using search of key words such as serotonergic modulation and visual processing, serotonergic modulation and sensory processing, and intracellular or extracellular recordings in database like Pub-med, google scholar, and web of science. Results: In the visual cortex, serotonin primarily reduces the gain of visual responses, affecting both ongoing and evoked activities. This modulation is achieved through the activation of specific serotonin receptors, such as 5-HT1A and 5-HT2A receptors, which play distinct roles in regulating neuronal activity. Serotonin's influence on ongoing activity in the visual cortex is primarily mediated by 5-HT1A receptors. These receptors are known to decrease the baseline firing rates of neurons, thereby reducing the overall excitability of the cortical network. This reduction in ongoing activity helps to maintain a stable and less reactive state, which is crucial for filtering out irrelevant stimuli and maintaining focus on pertinent sensory inputs. The modulation of evoked activity by serotonin is largely attributed to the 5-HT2A receptors. When these receptors are activated, they can either suppress or enhance neuronal responses depending on the context. For instance, neurons with high baseline activity tend to be suppressed, while those with low baseline activity may be facilitated. This bidirectional modulation helps to fine-tune the sensory processing, ensuring that the visual cortex can adapt to varying levels of sensory input. One of the key effects of serotonin in the visual cortex is the reduction of response gain. This means that the amplitude of neuronal responses to visual stimuli is decreased, which can help prevent overstimulation and maintain a balanced sensory representation. This gain control mechanism is essential for adapting to changes in the environment and the internal state of the organism. The reduction in

response gain induced by serotonin has significant behavioral implications. For example, during periods of quiet vigilance, serotonin can help suppress unnecessary orienting reactions, allowing the organism to remain alert without being overly reactive to minor stimuli. This is consistent with the observed effects of serotonin in reducing the acoustic startle response and other reflexive behaviors. Overall, the serotonergic modulation of visual processing involves a complex interplay between different receptor subtypes and their respective roles in regulating ongoing and evoked neuronal activities. This intricate modulation ensures that the visual cortex can dynamically adjust its responses to meet the demands of the sensory environment and the organism's internal state. Conclusion: Serotonin modulates visual processing by regulating neuronal activities through various receptors. This ensures balanced sensory representation, preventing overstimulation. Future research should explore these mechanisms and their broader implications for sensory processing and neurological conditions.

Keywords : Neuromodulators; Serotonergic modulation; Neural functions

Count: 341
Abstract ID: 398
subject: Pain and Sensory Systems: Vision
Presentation Type: Oral

Resolving brain object categorization in space, time and frequency

Submission Author: Sasan Keshavarz

Sasan Keshavarz[1], Nafiseh Babaee[2], Abdol-Hossein Vahabie[3], Gholam-Ali Hossein-Zadeh[4]

1. School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
2. School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
3. School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
4. School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran

Background and Aim : Most object classification relies on visual information processing. However, the temporal and frequency dynamics of visual representations remain largely unknown. The low temporal resolution of fMRI limits its ability to investigate the timing of this process. EEG studies have focused on the time and frequency dynamics of encoding; however, their spatial resolution is poor. Combining data from both modalities can reveal how visual information is encoded in the brain across time, frequency, and space

Methods : We analyzed simultaneous EEG-fMRI data. Thirty visual stimulus classes were presented to subjects, divided into animate and inanimate categories. The animate was further split into human and animal subcategories, each split into face and body. The inanimate category was divided into artificial and natural subcategories. We first applied 9 band-pass filters to the EEG signal for the time-frequency analysis. We then applied the Hilbert transform to each of the 9 filtered signals, yielding an analytical signal with complex values at each time point. From this, the power and phase of the analytical signals were calculated. We epoched the EEG data around stimulus onset. Subsequently, we performed first-level fMRI analysis using SPM12 to obtain brain activity maps. The V1, IT, and Fusiform areas are the main regions responding to visual stimuli; therefore, we used V1 and IT-fusiform masks to extract 800 voxels from the t-contrast activity maps. We employed representational similarity analysis (RSA) to integrate information from both modalities. We constructed 30 × 30 matrices with stimulus classes on the vertical and horizontal axes for both the power and phase of the EEG and for two target fMRI regions. Each element in the matrix represents the difference in brain-evoked responses to a pair of visual stimuli. Finally, to compare the matrices derived from EEG and fMRI, we calculated Spearman's correlation between corresponding pairs of matrices

Results : We observed an effective separation of human images from other animate images in the brain. The largest difference was between the artificial images and the rest of the stimuli-evoked signals. The strongest similarity to the V1 was observed in alpha band, approximately 160 milliseconds after stimulus onset. The largest similarity to the IT was found in the phase component of EEG oscillations in the theta band, between 200 and 300 milliseconds. Using RSA analysis, we found that the correlation between the phase of the oscillations and V1 was present across almost all frequency bands. The correlation between the phase of the oscillations and IT was limited to the 0–20 Hz range. The correlation between power and V1 was present

across nearly all frequency bands, but this correlation appeared much later in higher frequencies. In some bands, a delayed correlation between the phase of oscillations and V1 was observed, indicating the feedback circuits to V1

Conclusion : Our findings show that the brain's coding processes for visual image categories are encoded in frequency bands, at times, and in brain regions. This study presents a general methodology for the comprehensive representation of information in the brain, applicable to all brain encoding and decoding applications

Keywords : EEG; fMRI; multimodal; Representational Dissimilarity Matrix; Hilbert Transform

Count: 342
Abstract ID: 655
subject: Pain and Sensory Systems: Vision
Presentation Type: Poster

Effect of Vidian nerve schwannoma on vision

Submission Author: MohammadAmin Karimi

MohammadAmin Karimi[1], Zahra Amirkhani[2], Mohsen Mahmoudi[3], Mehrdad Shabani[4]

1. Medical student, Student Research Committee, Larestan University of Medical Science, Larestan, Iran
2. Assistant Professor, Student Research Committee, Larestan University of Medical Science, Larestan, Iran
3. Medical student, Student Research Committee, Larestan University of Medical Science, Larestan, Iran
4. Medical student, Student Research Committee, Larestan University of Medical Science, Larestan, Iran

Background and Aim : Schwannoma is a rare benign tumor that develops in the nervous system. It is composed of Schwann cells, which produce myelin to insulate peripheral nerves. The Vidian nerve, also known as the nerve of the pterygoid canal, is a branch of the facial nerve at the geniculate ganglion. It is formed by the union of the deep petrosal and greater petrosal nerves. Anatomically the Vidian nerve canal is located in the sphenoid sinus floor, lateral to the pterygopalatine canal, and extends the pterygopalatine fossa to the foramen lacerum. Vidian nerve schwannoma is a rare tumor that originates from the Schwann cells of the Vidian nerve. The aim of this study is to investigate the effect of Vidian nerve schwannoma on vision.

Methods : The present paper is a review study. In this study,11 articles published from 2018 to2024, which were in the form of quantitative studies, meta analysis and original research and systematic review were examined. Entry criteria included: Availability of full text and articles published between 2018 and 2024, and exit criteria included: Case Report studies. The study used the keywords Vidian nerve, Schwannoma, Vision.

Results : The Vidian nerve is involved in the parasympathetic and sympathetic innervation of the nasal mucosa, lacrimal gland, and palatine glands. Schwannomas of the vidian nerve can manifest with diverse clinical symptoms. Injury to the vidian nerve can lead to reduced or absent tear production, corneal dryness, nasal mucosa dryness, and cluster headaches. Vidian nerve schwannomas can impact vision through various mechanisms. Patients with vidian nerve schwannoma may present with ocular symptoms due to the tumor's pressure on nearby structures. For instance, a case report described a patient with a vidian nerve schwannoma who experienced right periorbital pressure, third cranial nerve palsy, and visual field defect. This indicates that the tumor can indeed affect vision. Diagnosis typically involves imaging and ophthalmologic assessments, and treatment usually involves surgical resection to relieve pressure on the affected structures. However, recent research indicates that occurrences of this disorder are very rare.

Conclusion : Vidian nerve schwannomas are uncommon types of facial nerve schwannomas, which may lead to eye-related symptoms due to pressure on surrounding tissues. Because they

are rare, they might not be initially thought of in diagnosis, necessitating a high level of suspicion and detailed imaging studies.

Keywords : Vidian nerve, Schwannoma, Vision

Count: 343
Abstract ID: 617
subject: Pain and Sensory Systems: Auditory and Vestibular
Presentation Type: Poster

Differences in auditory efferent system performance at the brainstem level in children with auditory processing disorder compared to the normal group

Submission Author: Mohaddese Vahabi

Mohaddese Vahabi[1], Mohanna Javanbakht[2], Enayatollah Bakhshi[3]

1. Student Research Committee, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
2. Department of Audiology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
3. Department of Biostatistics and Epidemiology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Background and Aim : Although auditory efferent system has a significant role in different auditory skills, due to its neural structure's complexity and lack of appropriate assessment tools, it has been less investigated in the studies, compared to the auditory afferent system. Besides, most of the studies in this field have investigated the caudal part of auditory efferent system using OAE suppression and less attention has been paid to its higher levels. As speech-evoked auditory brainstem response in contralateral noise (s-ABR in noise) has proven to be a proper option for evaluating the rostral part of auditory efferent system, and detailed understanding of auditory efferent system and its role in auditory processing mechanisms can be a step towards early and effective diagnosis and intervention of auditory processing disorder (APD), the present study aimed to do a more comprehensive investigation of the auditory efferent system at the level of brainstem using s-ABR and s-ABR in noise in children with APD compared to the normal group.

Methods : In this cross-sectional descriptive-analytical study, s-ABR and s-ABR in noise in 18 children with APD and 20 normal children in the age range of 7 to 10 years (M= 8.26, SD= 1.03) who met the inclusion criteria were recorded and then, using appropriate statistical tests, results were compared in each group as well as between the two groups.

Results : Comparing the results of s-ABR with s-ABR in noise showed that noise stimulation at the same time as recording the response leads to significant increase in latencies of the transient parts of the response and significant decrease in V/A slopes in both groups (P-value < 0.05), and the amount of these changes are more in the APD group. There are also significant differences between waves D and F latencies and F1 amplitudes of the s-ABR and s-ABR in noise results in the APD group. Additionally, by comparing s-ABR in noise results between the groups, it was found that in the APD group, amplitudes of the frequency components (F1 and HF) and V/A slopes are significantly lower and all waves' latencies are greater, in comparison to the normal group.

Conclusion : Greater latencies and lower frequency components' amplitudes and V/A slopes in the APD group indicate frequency coding deficits, temporal processing delays and neural synchrony defects at the response producing centers at rostral levels of the brainstem, suggesting that children with APD have problems in the temporal and spectral processing of complex acoustic signals, such as speech, and auditory processing in this group, compared to the normal group, is more affected by noise due to functional impairments of auditory efferent system at the rostral levels of the brainstem. These results confirm the auditory efferent system performance differences at the brainstem level in children with APD, compared to the normal group, which can to some extent explain why patients with this disorder have poor speech perception in noise and poor listening skills.

Keywords : Auditory efferent system; Auditory processing disorder; Speech-evoked auditory brainstem response; Speech-evoked auditory brainstem response in noise

Count: 344
Abstract ID: 725
subject: Pain and Sensory Systems: Chemical Senses: Olfactory and Taste
Presentation Type: Oral

A case study on the effect of olfactory stimulation on a 6 years old boy with glutaric aciduria type 1 with dystonia

Submission Author: Hossein Bayat

Hossein Bayat[1]

1. Faculty of medicine, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Dystonia is a hyperkinetic movement disorder characterized by sustained or intermittent involuntary muscle contractions. It affects approximately 5 to 30 individuals per 100,000 population, with various associations and treatment options proposed. One emerging area of interest in dystonia research is the role of olfactory system deficiency. Previous studies have suggested olfactory stimulation as a potential non-invasive therapeutic approach for other hyperkinetic disorders, including Parkinson's disease. This study investigates a 6-year-old boy with glutaric aciduria type 1 (GA1), a metabolic disorder resulting from glutaryl-CoA dehydrogenase deficiency. The patient presented with macrocephaly and atrophic changes in the frontoparietal and temporal lobes. Clinical examination revealed severe dystonic choreoathetosis affecting the lower face, jaw, tongue, and neck, resulting in a dystonia score of 59 on the Global Dystonia Severity Rating Scale (assessed via video review). He also experienced dysphagia due to dystonic movements of the head and neck, accompanied by a diminished gag reflex. Prior to this study, the patient had received comprehensive rehabilitation services, including speech, occupational, and physical therapy, which reduced extremity spasms but had limited impact on his dystonia, axial hypotonia, and moderate drooling, as reported by family members. Additionally, he exhibited frequent aspiration with solid foods and produced only ten recognizable words with minimal vocalization.

Methods : The intervention consisted of a four-week olfactory stimulation program involving daily exposure to the scents of coffee, orange peel, and vanilla, integrated with ongoing rehabilitation therapies. Each scent was presented for 3–5 seconds, repeated twice per session, and administered by family members at least twice daily. This olfactory therapy was supplemented with standard rehabilitation protocols, including orofacial tactile stimulation, passive exercises to enhance range of motion, and gustatory stimulation using a bitter coffee taste to improve the gag reflex. Although families were trained to complete these exercises at home, compliance was reportedly inconsistent.

Results : After four weeks, the patient demonstrated improvements, with a reduction in the dystonia score to 25, indicating a decrease of 21 points (a 65.62% reduction in head and neck scores) in orofacial dystonia. Drooling was stopped, the gag reflex returned to normal, and hypotonia in the head and neck showed improvement.

Conclusion : While existing literature has highlighted the effects of olfactory (chemical) stimulation in dystonic conditions, such as cervical dystonia and adult-onset blepharospasm, the specific therapeutic mechanisms and efficacy of olfactory interventions in GA1 remain largely unexplored due to the complexity of neurological involvement. This case represents the first report on the potential benefits of olfactory stimulation in managing GA1-related dystonia and dystonia itself. Although further studies may be challenging due to the rarity of GA1, similar interventions could be investigated in other dystonic patients with or without dysphagia.

Keywords : (olfactory stimulation), (tactile stimulation), (dystonia), (dysphagia)

Count: 345
Abstract ID: 674
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Dextromethorphan: From Traditional Cough Suppressant to Innovative Analgesic

Submission Author: Mahdiyeh Safary

Mahdiyeh Safary[1], MohammadReza Zarrindast[2], Sakineh Alijanpour[3], Shadi Sarahroodi[4], Mohaddeseh Ebrahimi-Ghiri[5]

1. Department of Pharmacology and Toxicology, Faculty of Pharmacy and Pharmaceutical Sciences, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
2. Professor of Pharmacology, Department of Pharmacology School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Associate Professor of Biology, Department of Biology, College of Science, Gonbad kavous University, Gonbad, Iran
4. Assistant Professor of Pharmacology, Department of Pharmacology and Toxicology, Faculty of Pharmacy, and Pharmaceutical Science, Tehran Medical Sciences, Islamic Azad Univerdity, Tehran, Iran.
5. Associate Professor of Biology ,Department of Biology, Faculty of Sciences, University of Zanjan, Zanjan, Iran

Conclusion : Introduction: Pain management is complex, and there are few effective pharmacotherapy options available. N-methyl-D-aspartate (NMDA) receptor antagonists have shown promise in alleviating somatic and neuropathic pain. These receptors play crucial roles in neuronal development and neurological and psychiatric disorders. Dextromethorphan is one such NMDA receptor antagonist with a history of clinical safety as a cough suppressant. It works by modulating NMDA receptors and regulating voltage-gated calcium channels to mitigate neuronal firing associated with excitotoxicity. Material and method: A systematic search was performed across PubMed, MEDLINE, Cochrane libraries, and Google Scholar databases to investigate the role of dextromethorphan in pain management. The review focused on English language articles, clinical trials, and case reports published from 2000 to 2024 Results: Narcotics are commonly used for postoperative pain management but are associated with various adverse effects. In contrast, NMDA antagonists offer both analgesic benefits. Dextromethorphan, particularly at doses between 30 to 90 mg, has proven effective in reducing pain during and after surgical procedures. Research indicates that dextromethorphan can alleviate acute pain while minimizing significant side effects, potentially decreasing the need for traditional analgesics in postoperative care. However, its effectiveness in chronic pain management remains uncertain. A double-blinded study revealed that administering dextromethorphan intravenously at a dosage of 5 mg/kg before surgery significantly reduced postoperative morphine consumption, suggesting its preemptive analgesic properties. Additionally, a higher intramuscular dose of 120 mg before incision effectively blocked central sensitization associated with NMDA receptor activation, leading to a notable decrease in meperidine use over 24 hours, underscoring dextromethorphan's supportive role in postoperative pain management. Phantom limb pain, which can be severe and disabling, may

benefit from dextromethorphan, as a dosage of 120 to 270 mg/day resulted in a 50% reduction in pain intensity and improved mood, indicating its potential in addressing persistent phantom pain linked to NMDA receptor hyperexcitability. In the context of cancer treatment, opioids remain the primary treatment for cancer-related pain, despite risks of addiction and respiratory depression. Dextromethorphan shows promise as an adjunctive therapy for pain relief in cancer patients, although its effectiveness in chronic cancer pain is still unclear. Peripheral neuropathy, particularly among individuals with diabetes, poses significant difficulties in managing pain. NMDAR inhibitors have proven effective for specific types of neuropathic pain; however, their effectiveness in treating postherpetic neuralgia remains constrained. Recent investigations into proteins that interact with NMDAR may pave the way for novel therapeutic strategies. A study indicated that dextromethorphan resulted in a notable decrease in pain intensity for patients suffering from diabetic neuropathy, yet it had a limited effect on postherpetic neuralgia, implying the presence of distinct underlying mechanisms of pain. Conclusion: NMDA antagonists have been recognized for their substantial impact on pain management, particularly in cases of postoperative pain, neuropathy, cancer-related pain, and phantom limb pain. Dextromethorphan, historically regarded as an effective cough suppressant, may also serve as a promising option for pain management due to its mechanism of NMDA receptor antagonism. Further preclinical and clinical research is necessary to explore its potential in this area.

Keywords : Dextromethorphan; neurodegenerative disease; cough suppressant; novel treatment

Count: 346
Abstract ID: 611
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

Comparative efficacy and safety of venlafaxine versus nortriptyline in migraine prophylaxis: A randomized, double-blind clinical trial

Submission Author: Saeid Iranzadeh

Saeid Iranzadeh[1], Mehrdad Roghani[2], Gholamhossein Ghaedi[3], Mohammad Hossein Golezar[4], Siamak Afshinmajd[5]

1. Neurophysiology Research Center, Shahed University, Tehran, Iran
2. Neurophysiology Research Center, Shahed University, Tehran, Iran
3. Department of Psychiatry, Faculty of Medicine, Shahed University, Tehran, Iran
4. School of Medicine, Shahed University, Tehran, Iran
5. Department of Neurology, Faculty of Medicine, Shahed University, Tehran, Iran

Background and Aim : Migraine, as a primary headache disorder, is recognized as one of the primary causes of disability worldwide. Therefore, prophylactic interventions are highly suggested for patients experiencing recurrent migraine episodes. This study aimed to assess and compare the efficacy and safety profiles of venlafaxine and nortriptyline for prophylactic migraine management.

Methods : In this prospective, randomized, double-blind, parallel-group clinical trial, 210 migraine patients were allocated into two groups in a 1:1 ratio. One group was prescribed tablet venlafaxine (37.5 mg, p.o. BID), whereas the other group received tablet nortriptyline (25 mg, p.o. Daily). A neurologist assessed the headache intensity using the Visual Analog Scale (VAS) and the 6-point Behavioral Rating Scale (BRS-6), measured the headache frequency per month, and recorded the duration of headaches in hours for participants on days 0, 45, and 90 of the intervention.

Results : After the 90-day treatment period, a notable reduction in VAS, BRS-6, headache frequency, and duration in both groups was observed (all with p-values <0.001). No statistically significant disparities were observed in VAS, BRS-6, or headache durations between the groups at the 45-day and 90-day evaluations of the intervention (all p-values > 0.05). Although the headache frequency exhibited no difference between the groups after 45 days (p-value = 0.097), a significantly lower frequency in the venlafaxine group was observed at day 90 of the intervention (p-value = 0.011). There were no statistically significant differences in the reductions of attack parameters between the two groups during the 0–45-day and 0–90-day intervals (p-values > 0.05). 77.0 % of the participants in the venlafaxine group and 79.2 % in the nortriptyline group experienced at least a 50 % improvement in all attack parameters. Venlafaxine generated a significantly lower occurrence of side effects than nortriptyline (p-value = 0.005). There were 33 reported side effects in the venlafaxine group and 53 in the nortriptyline group, with insomnia being the predominant side effect in the former and xerostomia in the latter.

Conclusion : Venlafaxine and nortriptyline demonstrate clinically significant and comparable therapeutic efficacy for migraine patients in reducing the intensity, frequency, and duration of headache attacks. Venlafaxine might be the preferable choice over nortriptyline in the context of migraine preventive treatment under comparable conditions owing to its lower incidence of adverse effects.

Keywords : Migraine headache; Venlafaxine; Nortriptyline; Prophylactic treatment

Count: 347
Abstract ID: 325
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Exploring the Therapeutic Efficacy of Gallic Acid-Encapsulated Niosomal Nanoparticles: A Novel Approach for Targeted Pain Relief and Inflammation Modulation in Male Rats

Submission Author: Rezvan Sohrabi

Rezvan Sohrabi[1], Fatemeh Abdollahi[2], Fatemeh Dalvand[3], Mojtaba Khaksarian[4]

1. Neurophysiology Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
2. Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran
3. Student Research Committee, Lorestan University of Medical Sciences, Khorramabad, Iran
4. Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

Background and Aim : Gallic acid, a potent phenolic compound, is known for its remarkable anti-inflammatory, antioxidant, and analgesic effects. This study was conducted to investigate the analgesic and anti-inflammatory potential of niosomal nanoparticles encapsulating gallic acid in male rats.

Methods : Gallic acid-loaded niosomal nanoparticles were prepared using a thin-film hydration method and characterized for their size, zeta potential, and entrapment efficiency. After determining the optimal dose of 100 mg/kg, gallic acid-loaded niosomal nanoparticles and indomethacin (10 mg/kg) were orally administered to evaluate their impact on pain and inflammation in rats. The analgesic activity of both treatments was evaluated using the tail-flick and formalin tests in rats. The anti-inflammatory effects of the treatments were assessed using the carrageenan-induced rat paw edema model.

Results : The results indicated that the gallic acid-loaded niosomal nanoparticles had a uniform size and high entrapment efficiency for gallic acid. The niosomal nanoparticles loaded with gallic acid, along with indomethacin, were found to significantly reduce both acute and chronic pain responses in the formalin-induced pain model. In the tail-flick test, we observed a significant increase in latency, and a reduction in the development of carrageenan-induced paw edema, following treatment with both gallic acid-loaded niosomal nanoparticles and indomethacin compared to the control group.

Conclusion : The findings suggest that oral administration of gallic acid-loaded niosomal nanoparticles exhibits potent analgesic and anti-inflammatory effects in male rats, with efficacy comparable to that of indomethacin, a well-established anti-inflammatory and analgesic agent. This study highlights the potential of gallic acid-loaded niosomal nanoparticles as an innovative drug delivery system, capable of significantly enhancing the therapeutic effectiveness of gallic acid in the treatment of various inflammatory disorders.

Keywords : Niosom, Carrageenan, Formalin, Pain, Inflammatory

Count: 348
Abstract ID: 158
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

Evaluating the synergistic effect of codeine, oxycodone and metformin on reducing neuropathy and expression of TNF-α and IL6 and increasing Sirt1 in diabetic mice

Submission Author: Ramin Ataee

Ramin Ataee[1], Amin Babaee[2], Parisa Saberi Hasanabadi[3]

1. Medicinal Plants Research Center, Hemoglobinopathy institute, Mazandaran University of Medical Sciences, Sari, Iran
2. Student research commeettee, Faculty of Pharmacy, Mazandaran University of Medical Science, Sari, Iran
3. Student research commeettee, Faculty of Pharmacy, Mazandaran University of Medical Science, Sari, Iran

Background and Aim : Recently, evidence of the antidiabetic properties of oxycodone and codeine has also been observed. This study aimed to evaluate the synergistic effect of combined treatment of codeine, oxycodone with metformin on reducing blood sugar and neuropathy, as well as investigating the expression of TNF-α, SIRT1, and IL6 genes in the brain and liver of mice.

Methods : 36 mice were divided into 6 groups. The negative control group which received normal saline, while the remaining groups were induced diabetic using streptozotocin and divided into 5 groups: diabetic control group, positive control group (treated with Metformin), Oxycodone, Codeine, and Metformin groups, and combined Codeine and Metformin group. All drugs were dissolved in normal saline and injected intraperitoneally. Fasting blood glucose levels were measured before and after drug administration period, and the hot plate test was used to assess neuropathic pain. At the end of the study, liver and brain tissues were collected for real-time polymerase chain reaction (RT-PCR) and analysis of TNF-α, SIRT1, and IL6 gene expression.

Results : The hot plate test and analysis of SIRT1 and TNFa gene expression revealed a significant synergistic effect between oxycodone, codeine, and metformin in reducing blood sugar ,alleviating neuropathic pain and increasing expression of SIRT1 and decreasing TNFa($P<0.05$).However, this synergistic effect was not for decreasing IL6 genes expression ($P>0.01$).

Conclusion : This research indicates that the combination of oxycodone and codeine, in conjunction with metformin, had significant enhance in reducing blood sugar levels and neuropathy and decreasing of some inflammatory factors in mice and could be considered for future experimental and clinical studies.

Keywords : Streptozotocin, Oxycodone, Codeine, Metformin, Diabetes, Neuropathy

Count: 349
Abstract ID: 287
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

The effects of acute and chronic administration of morphine mu mRNA expression levels in the lumbar spinal cord of intact and gonadectomized male rats in the absence and presence of inflammation

Submission Author: Somayeh Vazifehkhah

Somayeh Vazifehkhah[1], Mohadeseh Chahkandi[2], Nayereh Askari[3]

1. Department of Basic Sciences, Faculty of Medicine, Sari Branch, Islamic Azad University, Sari, Iran
2. Cellular and Molecular Research Center, Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran.
3. Department of Biology, Faculty of Sciences, Shahid Bahonar University of Kerman, P.O.Box 76135-133, Kerman, Islamic Republic of Iran

Background and Aim : The use of opioids in pain management is associated with challenges such as tolerance, addiction, and immunosuppression. Since the primary target of opioids is their receptors, a better understanding of their effects on these receptors can help manage opioid use (1, 2). Among opioids, morphine is one of the most effective analgesic drugs, and its physical dependence and psychological addiction are of interest (3). Studies have shown that in the spinal cord, analgesia produced by morphine at normal analgesia doses is mediated by MOR (mu-opioid receptor), but at higher doses, it is made by opioid receptor capacity (4,5). Studies have also shown modifications in MOR and KOR (kappa-opioid receptor) gene expression during morphine administration. The analgesic effect of opioids has been a recognized fact for centuries (6), but what is interesting is their effect in reducing inflammation and enhancing the analgesic effect of opioids in the presence of inflammation (7). Research has shown that hind foot inflammation increases the expression of MOR while decreasing the expression of KOR receptors (8,9). The presence of conflicting results motivated us to investigate the effect of acute and chronic morphine consumption on the expression of the MOR opioid receptor gene in the spinal cord of male rats in both the presence and absence of carrageenan-induced inflammation. Various research have shown the effect of gonadotomy on opioid analgesics (10,11). The results of a group showed that testosterone plays an effective role in creating tolerance to the analgesic effects of morphine, so its removal reduced tolerance, while the removal of female sex hormones did not have much effect on tolerance (12).

Methods : Male rats (n=54) were randomly divided into 9 groups: a control group and a sham group (gonadectomized animals, GDX sham) that received normal saline as the vehicle. The carrageenan groups (lambda, 1.5%) had animals receive carrageenan into the plantar surface of their paws. The chronic morphine groups (CMF, CMR +CAR, and CMF +GDX) received intraperitoneal injections of chronic morphine. The acute morphine groups (AMF, AMR +CAR, and AMF +GDX) were treated with intraperitoneal injections of acute morphine (10 mg/kg of body weight). In the chronic morphine groups, morphine (10 mg/kg of body weight)

was injected in double doses (8 AM and 8 PM) for 8 consecutive days. Inflammation was induced by carrageenan injection, followed by a single dose of 10 mg/kg morphine, and 6 hours later, the animals were sacrificed to collect their lumbar spinal cords

Results : Our results showed a significant difference in MOR gene expression among the different groups. Additionally, assessing the role of gonadectomy on MOR gene expression revealed that the CAR + AMOR + GDX and CAR + CMOR + GDX groups had lower KOR gene expression compared to the CAR group.

Conclusion : Based on the present results, the occurrence of tolerance prevented the increase in gene expression caused by carrageenan and despite the inflammation, the expression level of MOR and KOR does not increase beyond control. Also, the presence of sex hormones reduces inflammatory responses by reducing the density of interleukin receptors.

Keywords : morphine, inflammatory, MOR gene.

Count: 350
Abstract ID: 313
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Evaluating Selegiline effect on Streptozocin induced diabetic neuropathy in Wistar male rats: Possible role in oxidative stress and apoptosis

Submission Author: Mobina Abdoli

Mobina Abdoli[1], Elham Saghaei[2], Hossein ataei[3]

1. Student Reaserch Committe, Shahrekord University of Medical Sciences, Shahrekord, Iran
2. Medical Plans Research center, basic health Sciences Institute, shahrekord University of Medical Sciences,Shahrekord ,Iran
3. Student Reaserch Committe, Shahrekord University of Medical Sciences, Shahrekord, Iran

Background and Aim : Diabetes is a metabolic disorder that significantly diminishes the quality of life, often leading to complications such as Peripheral diabetic neuropathy(PDN). According to the findings, 30% of PND patients under treatment had only 30% pain reduction. Monoamine oxidase(MAO) is recognized as a prominent mechanism that elevates oxidative stress within the nervous system. Selegiline is an irreversible MAO inhibitor with a neuroprotective effect. In PND, the elevation of MAO increases oxidative stress, damaging peripheral nerve components, including ganglia and Schwann cells, which causes allodynia. This study aimed to examine the therapeutic potential of Selegiline in addressing the symptoms associated with painful PDN like myelin thickness, small neuron density, and level of oxidative stress of sciatic nerves in a streptozotocin-induced PDN model.

Methods : In this in vivo experimental study, Following ethical committee approval, a total of 56 male Wistar rats were randomly assigned to five groups: non-diabetic and control group(CTL), diabetic(DM), diabetic receiving insulin(DM+INS), and diabetic receiving a dose of Selegiline(SEL), diabetic receiving a dose of Selegiline and combination with Insulin(SEL+INS). Diabetes was induced using 52.5 mg/kg streptozocin(STZ) and rats received 10 mg/kg selegiline daily. To determine the progression of mechanical allodynia, von Frey tests were performed weekly from the first week to 6th week. After six weeks, the mice were euthanized through the Designated dosage of ketamine and xylazine. The tissue of the sciatic nerve was isolated and analyzed through Toluidine blue staining to assess the extent of axonal and myelin damage. To assess oxidative stress levels in the sciatic nerves, the level of antioxidant capacity, and the concentrations of malondialdehyde(MDA) and nitrite were measured. Finally, all study results were analyzed using GraphPad-Prism(9th-ed). Repeated measures of Two-way ANOVA or One-way ANOVA with Tukey's post-hoc test were applied as appropriate. Data were presented as Mean±SD and mean difference(MD).

Results : As a result of Von Frey tests, the DM exhibited a significant reduction in pain threshold starting from the third week(MD=5.00, P=0.01) Nevertheless, the SEL&INS exhibited no notable variation. The total Area under the curve(AUC) in the Von Frey test

comparison exhibited a significant reduction in the DM group compared to the CTL; however, selegiline did not significantly alter the AUC. The analysis of sciatic tissue indicated a notable decrease in myelin thickness within the DM when compared to the CTL. Selegiline may also mitigate the pathological decrease in myelin diameter(0.70±0.05 compared to 0.58±0.03, $P<0.05$), and the combination of this treatment with insulin produced a synergistic effect. Selegiline only reduced MDA levels compared to the DM group; however, the SEL+INS did not yield better outcomes than the DM+INS treatment without selegiline.

Conclusion : This research represents the inaugural investigation into the efficacy of Selegiline for treating peripheral neuropathies, with a particular focus on painful diabetic neuropathy(PDN) Selegiline daily treatment in diabetic rats effectively prevented rats' myeline sheath damage; however, it could not alleviate rats' pain. This therapeutic approach also results in a decrease in oxidative stress.

Keywords : Diabetes; Peripheral diabetic neuropathy; Selegiline

Count: 351
Abstract ID: 647
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

Investigating the Analgesic Effects of Alcoholic Extract of Zarin Plant in a Compressed Sciatic Nerve Model and Formalin Test in Syrian Mice

Submission Author: Hesam Hojat

Hesam Hojat[1], Fatemeh Rasouli[2], Zakieh Keshavarzi[3]

1. Seyed Hesam Hojjat Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Fatemeh Rasouli f.rasouli@nkums.ac.ir Student Research Committee, North Khorasan University of Medical Sciences, Bojnurd, Iran Faculty of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
3. Professor of medical physiology, North Khorasan University of Medical Sciences, Bojnurd, Iran

Background and Aim : Introduction: Neuropathic pain is a chronic condition resulting from injury to the central or peripheral nervous system, characterized by spontaneous pain and heightened sensitivity to stimuli. The search for effective treatments has led to increased interest in natural remedies, particularly herbal extracts. Objective: This study aims to evaluate the analgesic effects of the alcoholic extract of the Zarin plant (*Dracocephalum kotschyi*) on neuropathic pain using hot plate and formalin tests in Syrian mice.

Methods : Methods: In this experimental study, male Syrian mice were randomly divided into five groups: a control group, a group receiving a therapeutic dose of 12.5 mg/kg of the Zarin plant, a group receiving 25 mg/kg of the Zarin plant, a group receiving 50 mg/kg of the Zarin plant, and a group receiving 5 mg/kg of imipramine. Pain assessment was performed using two methods: the hot plate test and the formalin test. In the formalin test, in addition to evaluating acute pain, the effects of the Zarin plant on chronic pain (phase two) were also examined. Results were analyzed as Mean ± SEM using ANOVA and Tukey statistical tests. Ethical considerations were adhered

Results : Results: Treatment with 25 mg/kg and 50 mg/kg doses of Zarin plant extract significantly increased pain tolerance in the hot plate test compared to controls ($p < 0.05$). However, no significant differences were observed in formalin test responses across treatment groups, indicating that Zarin plant extract may not affect chemical hyperalgesia

Conclusion : Conclusion: The Zarin plant exhibits potential analgesic properties against thermal hyperalgesia but does not significantly impact chemical hyperalgesia as measured by formalin testing. These findings support further investigation into the therapeutic applications of Zarin plant extract in managing neuropathic pain.

Keywords : Neuropathic pain, Zarin plant, analgesic effects, hot plate test, formalin test

Count: 352
Abstract ID: 548
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

Comparison of the effect of chamomile topical product on the symptoms of leg muscle cramps caused by exercise with diclofenac cream: A randomized, double-blind, placebo-controlled trial

Submission Author: Hamid Askari

Hamid Askari[1], seyed ali muzaffarpour [2], mustafa Ahmadi [3], Hoda shirafkan [4]

1. Research Committee, Babol University of Medical Sciences, Babol, Iran
2. Traditional Medicine and History of Medical Sciences Research Center, Babol University of Medical Sciences, Babol, Iran
3. Traditional Medicine and History of Medical Sciences Research Center, Babol University of Medical Sciences, Babol, Iran
4. Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Background and Aim : Muscle cramps, especially those induced by physical activity, are a common and often painful condition. While various pharmacological treatments exist, they are often associated with undesirable side effects. In traditional medicine, the use of herbal remedies such as chamomile has long been explored for its potential therapeutic benefits

Methods : A randomized, double-blind, placebo-controlled trial was conducted. Participants were individuals aged 20-60 who experienced exercise-induced cramps in the gastrocnemius muscle and have the Visual Analog Scale (VAS) more than 6. They were randomly assigned to either the chamomile or diclofenac group by permuted block randomization method. According to clinical experience, patients were evaluated daily for at least one week and at most until reaching a score of less than 4 in VAS expression. The VAS score of the patients was evaluated at the beginning of the study and then every other day. The primary outcome measure was the reduction in pain intensity, which was assessed using the Visual Analog Scale (VAS). Secondary outcomes included the duration of cramps and the occurrence of adverse events. Participants applied the cream to the affected area and recorded their pain levels daily.

Results : Sixty patients were enrolled in the study and randomly assigned to either the chamomile or diclofenac group. There was no significant difference in the reduction of VAS between the chamomile and diclofenac groups at the end of the study (P-value= 0.55). However, the duration of treatment was significantly shorter in the chamomile group compared to the diclofenac group (P-value=0.01). No significant adverse events were observed in either group during follow-up.

Conclusion : Chamomile and diclofenac reduce the severity of pain caused by muscle cramps to the same extent, but the duration of pain treatment is shorter with chamomile

Keywords : Chamomile, pain, muscle cramps, herbal medicine, VAS

Count: 353
Abstract ID: 544
subject: Pain and Sensory Systems: Other
Presentation Type: Poster

The Nervous Function Of Hand After Radial Artery Harvest In CABG Patients

Submission Author: Mohammad Shafiei

Mohammad Shafiei[1], Zahra Keshtkaran[2], Meghdad Abdollahpour-Alitappeh[3], Fatemeh Soukhak[4]

1. Student Research Committee, Larestan University of Medical Sciences, Larestan,
2. Community Based Psychiatric Care Center, Department of Community Health Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran,
3. Department of Nursing, School of Nursing, Larestan University of Medical Sciences, Larestan, Iran
4. Department of Nursing, School of Nursing, Larestan University of Medical Sciences, Larestan, Iran

Background and Aim : In Coronary Artery Bypass Graft (CABG) patients, radial artery is harvested due to coronary clogging, surgeon preference and other patient condition. Radial harvest may lead to interfere function of hand nervous because of cutting peripheral nerve. In this study we assess the nervous function of hand and fingers after radial harvest.

Methods : In this randomized study, patients who had harvested radial artery refered to clinic.we suggested them to simple exercise and in advance cases, physiotherapy course

Results : Between June, 2023, and May, 2024, 72 patients were enrolled, almost every one complained of pain and disability to move their fingers at primary weeks. But after couple of weeks the pain had been relieved and the movement of fingers specially thumb finger had been progressed.

Conclusion : It seemed pain and disorder of hand nervous function was temporary and because of some exercise its functional could be as same as before. In additionally, due to efficiency and well structure of artery it could be very useful to harvest radial artery in CABG patients.

Keywords : Nervous Function, Radial Artery, Nervous Disorder

Count: 354
Abstract ID: 658
subject: Pain and Sensory Systems: Other
Presentation Type: Oral

Long-lasting effects of adolescent morphine exposure on action potential characteristics of vlPAG neurons

Submission Author: Nasrin Houshmandi

Nasrin Houshmandi[1], Hossein Azizi [2], Mahyar Janahmadi[3], Amir Shojaei[4], Saeed Semnanian[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. Neuroscience Research Center and Department of Physiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
5. Department of Physiology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

Background and Aim : The transition from childhood to adulthood, known as adolescence, is characterized by changes in biological, behavioral, and cognitive aspects. Typical adolescent behaviors, include risk-taking, intense emotions, and sensation-seeking. Risk-taking behavior can have consequences including substance use. Based on evidence exposure to morphine during adolescence leads to changes in pain perception, opioid tolerance, endogenous opioid system and electrophysiological properties of key regions in the opioid system. The ventrolateral periaqueductal gray (vlPAG) is a key brain area within the descending pain modulatory pathway and an important target for opioid-induced analgesia. Given the significance of the vlPAG area in regulating these features and the documented long-term impacts of opioid use during this period, this research sought to examine how chronic morphine exposure in adolescence affects the action potential characteristics of vlPAG neurons in adulthood.

Methods : To accomplish the study's objectives, adolescent rats were administered morphine or normal saline twice daily for 10 days. Subsequently, after the rats reached adulthood, we employed the whole cell patch clamp technique to study and analyze the action potential characteristics of vlPAG neurons in detail.

Results : The results indicated that chronic morphine exposure during adolescence increased the peak amplitude and decreased the half-width of action potentials in vlPAG neurons. This finding suggests that prolonged opioid interaction during this critical developmental period enhances the excitability of these neurons and modifies the timing dynamics of their action potentials.

Conclusion : Exposure to morphine during adolescence can cause electrophysiological alterations in the action potential properties of the vlPAG neurons. These findings are essential considering the physiological and behavioral changes that accompany adolescence, highlighting the need for increased awareness of the risks associated with substance use during this critical developmental period.

Keywords : adolescent, morphine exposure, vlPAG, long-lasting effects of morphine

Count: 355
Abstract ID: 368
subject: Motor Systems and Movement Disorders: Motor Neurons and Muscle
Presentation Type: Poster

Malnutrition and dietary therapy in Amyotrophic lateral sclerosis(ALS)

Submission Author: Fatemeh Nooriyan

Fatemeh Nooriyan[1], Mohammadreza Miriyani[2], Zahra Amirkhani[3]

1. Student research committee, Larestan university of medical sciences, Larestan, Iran
2. Student research committee, Larestan university of medical sciences, Larestan, Iran
3. Student research committee, Larestan university of medical sciences, Larestan, Iran

Conclusion : Metabolic and nutritional factors appear to play a role in some of the mechanisms involved in the development of ALS. It is noteworthy that energy metabolism appears impaired, and energy consumption increases in a higher proportion of ALS patients to hypermetabolic state. Metabolic changes in patients with ALS occur from the beginning and during the progression of the disease. In general, the observed hypermetabolic state and weight loss may lead to muscle loss and cashexia. There is insufficient evidence to support any specific dietary intervention regarding macronutrients or nutritional content, or antioxidant supplemental formulations relative to another. Further studies are needed to better examine the metabolic and nutritional aspects related to ALS mechanisms and provide better nutritional care in patients with ALS. Patients were advised to correct their eating habits by reducing their intake of saturated fats, phosphorus and sodium and increasing intake of healthy fats for the heart, complex carbohydrates, high-quality proteins, fiber and antioxidants. These changes can help improve symptoms and slow the progression of the disease.

Keywords : Amyotrophic lateral sclerosis(ALS) ; Malnutrition ; Dietary therapy

Count: 356
Abstract ID: 311
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Aptamer can prevent amyloidal aggerates formation in α-synuclein, potentially leading to a new approach for targeted Parkinson's disease (PD) treatment

Submission Author: Mahdi Karimian

Mahdi Karimian[1], Alireza Alikhanian[2], Farhang Aliakbari[3], Dina Morshedi[4]

1. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
2. School of Biology, College of Science, University of Tehran, Tehran, Iran
3. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
4. Bioprocess Engineering Department, Institute of Industrial and Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran

Background and Aim : Parkinson's disease (PD) is one of the most prevalent neurodegenerative diseases which is characterized primarily by the abnormal intracellular deposition of misfolded -aggregated α-synuclein (α-syn) renowned as synucleinopathy. α-syn aggregates trigger selective and progressive neuronal death through mitochondrial impairment, lysosomal dysfunction, and alteration of calcium homeostasis not only in PD but also in other α-syn-related neurodegenerative disorders such as dementia with Lewy bodies. One approach to control protein aggregation is using monoclonal antibodies. However, due to the essential weaknesses of antibody, the alternative way to disaggregate α-syn inclusions is to use aptamers. These single-stranded nucleic acids are specifically synthesized to bind to a particular target, reducing the likelihood of off-target effects. Additionally, aptamers have similar or higher binding affinity than antibodies and are less likely to trigger an immune response compared to antibodies, making them safer for long-term use. This report assessed the anti-aggregation impacts of an α-syn specific aptamer on α-syn fibrillation in a concertation manner profile.

Methods : The recombinant human α-syn was expressed and then purified using an engineered construct. Aptamer has been selected with the help of SELEX program and then synthesized. Monomeric α-syn 2 mg/mL (140 µM) was left aggregating in 96-wells plate in the presence or absence of aptamer in a range of concentrations, 10 µM, 25 µM and 50 µM solutions. The plate was rested shaking at 350 rpm and 37C with glass beads. After 24 hours the fibrillation process was analyzed by fluorometry and fluorescence imaging assays using an amyloidal specific dye, Thioflavin T (ThT).

Results : The fluorescence intensity of ThT for aptamer-treated protein was less than untreated α-syn between 33-66% in a concentration-dependent manner. In addition, the fluorescence microscope images indicate very less aggregated bodies in cases of aptamer treatment.

Conclusion : The result of ThT assay suggested that there is a considerable relationship between the presence of aptamer and α-syn amyloidal aggregates. The relationship could be described as the higher amounts of aptamer resulted in a lower rate of α-syn aggregations. To validate this assumption, we conducted fluorescence microscope imaging, which confirmed our fluorometry results. To utilize aptamers for clinical applications, further investigations in in-vivo and animal models should be carried out. In the next step, we aim to examine the cell toxicity of the designed aptamers.

Keywords : Alpha-synuclein; Aptamer; Anti-fibrillation; Parkinson's Disease; Synucleinopathy

Count: 357
Abstract ID: 205
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Parkinson's Disease Diagnosis via Deep Learning and MRI Image Processing

Submission Author: Reza Erfani Far

Reza Erfani Far[1], Sogand Abbasi Azizi[2]

1. Resident of Neurology, Department of Neurology, Rasoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran
2. Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background and Aim : Parkinson's disease (PD) is the second most common and one of the main types of neurological disorders affected by progressive brain degeneration, caused by loss of dopamine producing neurons. The substantia nigra region is deprived of its neuronal functions causing striatal dopamine deficiency which remains as hallmark in Parkinson's disease. Magnetic Resonance Imaging (MRI) is able to capture the structural changes in the brain due to dopamine deficiency in Parkinson's disease subjects. This study investigates the potential of combining deep learning algorithms with advanced MRI image processing techniques to enhance the early diagnosis of Parkinson's disease.

Methods : Our research utilized a dataset of 228 high-resolution 1.5T MRI scans, comprising 98 confirmed PD patients and 130 healthy controls. We employed state-of-the-art image processing techniques, including volumetric analysis, diffusion tensor imaging (DTI), and functional connectivity mapping, to extract comprehensive features from key brain regions associated with PD pathology. A deep learning framework, consisting of 3D convolutional neural networks (CNNs) and recurrent neural networks (RNNs), was developed to analyze the processed MRI data. The model was trained to identify structural and functional changes indicative of early-stage PD, with a particular focus on the substantia nigra, basal ganglia, and cortical regions.

Results : Our results demonstrate a diagnostic accuracy of 94%, with a sensitivity of 91.6% and specificity of 96%. The deep learning model successfully identified early-stage PD cases, even in the absence of clear motor symptoms. Moreover, our approach showed promise in differentiating PD from other parkinsonian syndromes, addressing a significant clinical challenge.

Conclusion : This study showed the potential of integrating deep learning with advanced neuroimaging techniques to improve the early diagnosis of Parkinson's disease. This approach may lead to earlier intervention and more personalized treatment strategies.

Keywords : Parkinson's disease, deep learning, image processing, neuroimaging.

Count: 358
Abstract ID: 246
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Movement Disorders in Chronic Kidney Disease - A comprehensive Review

Submission Author: Haniyeh Kazemi

Haniyeh Kazemi[1]

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

Background and Aim : The objective of this study is to describe the mechanism of damage to subcortical structures in chronic kidney disease (CKD) and to describe the range of movement disorders associated with CKD.

Methods : This review article was prepared based on the findings of the search in Web of Science, PubMed and Google Scholar databases from 2017 to 2023.

Results : The search revealed 100 articles most of them dealing with restless legs syndrome. The damage to basal ganglia in CKD resulted from several mechanisms including accumulation of nitro tyrosine caused by reactive oxygen species and action of uremic toxins leading to endothelial damage and dysfunction of blood-brain barrier. Involuntary movements in CKD include restless legs syndrome (RLS), myoclonus, asterixis, dystonia, chorea, tremor, and Parkinsonism.

Conclusion : Chronic kidney disease can cause several abnormal involuntary movements via damaging basal ganglia and subcortical structures. The most common movement disorders in CKD are RLS, myoclonus and asterixis. Restless legs syndrome and myoclonus when severe, need and respond to treatment. Movement disorders in CKD improve with improvement of kidney function.

Keywords : Chorea; Chronic kidney disease; Dystonia; Movement disorders; Myoclonus; Restless legs syndrome.

Count: 359
Abstract ID: 323
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Exploring the Link Between Inflammation and Cognitive Impairment in Parkinson's Disease: The Role of Neutrophil-to-Lymphocyte Ratio

Submission Author: Reyhane Khakbaz moghaddam

Reyhane Khakbaz moghaddam[1], Erfan Naghavi[2], Melika Arab Bafrani[3], Amirhossein Kamroo[4], Melika Kazembeigi[5]

1. Reyhane Khakbaz Moghaddam, School of Medicine, Islamic Azad University, Tehran Medical Branch
2. School of medicine, Tehran University of Medical Sciences
3. Students' Scientific Research Center (SSRC), Tehran University of Medical Sciences, Tehran, Iran
4. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran.
5. Psychology Payamenoor University, South Tehran Branch

Background and Aim : difficulties associated with PD encompass challenges in executive functions, attention, working memory, visuospatial abilities, memory, and language. These impairments adversely affect the quality of life for both patients and their caregivers. The neutrophil-to-lymphocyte ratio (NLR) is a simple biomarker calculated from the proportion of neutrophils to lymphocytes in peripheral blood and is frequently utilized as a sign of systemic inflammation. In PD, inflammation is a significant factor in the progression of the condition, and NLR can act as a marker for the neuroinflammatory processes that might lead to cognitive decline. In this study, we seek to investigate the relationship between NLR and cognitive decline, sleepiness, depression, and rapid eye movement sleep behavior disorder (RBD) in patients with PD and healthy controls (HCs) at both baseline and during the fourth year of follow-up.

Methods : collected at the baseline and 4th year of follow-up, including Montreal cognitive assessment (MoCA) score, Epworth sleepiness scale (ESS), RBD sleep questionnaire (RBDSQ), and geriatric depression scale (GDS). Partcipants with incomplete data were removed. A Kendall correlation was performed to examine the association of NLR with ESS, RBDSQ, GDS, and MoCA while adjusting for age, sex, and years of education.

Results : A total of 427 PD patients (average age = 61.68) and 194 HCs (average age = 60.91) were included at baseline, while at the fourth year, there were 328 PD patients (average age = 65.32) and 152 HCs (average age = 65.35). No correlations were found between the NLR and the ESS, the RBDSQ, the MoCA, or the GDS for HCs at both baseline and the fourth year of follow-up. Additionally, NLR showed no association with any measures for PD patients at baseline; however, by the fourth year, NLR was linked to MoCA ($r = -0.096$, $p = 0.009$) and ESS ($r = 0.080$, $p = 0.030$) among PD patients.

Conclusion : These results suggest that the NLR is linked to decreased cognitive function and increased sleepiness in PD patients by the fourth year of follow-up. The relationship between inflammatory biomarkers and cognitive impairments in PD is increasingly recognized as a critical area of interest. Specifically, increased neuroinflammation may disrupt neuronal function and contribute to synaptic loss, mechanisms that are essential for maintaining cognitive processes. Furthermore, chronic inflammation is linked to progressive neuronal damage and death, which not only contributes to the worsening of motor symptoms but also plays a substantial role in the emergence of non-motor symptoms, including cognitive impairment. Importantly, the early identification of inflammatory biomarkers in PD may offer valuable opportunities for interventions aimed at preventing or mitigating cognitive decline, thereby enhancing the quality of life for patients.

Keywords : neutrophil-to-lymphocyte ratio; cognition; sleepiness; Parkinson's disease

Count: 360
Abstract ID: 486
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Silymarin ameliorates motor function and averts neuroinflammation-induced cell death in the rat model of Huntington's disease

Submission Author: Mahdi Shakeri

Mahdi Shakeri[1], Abbas Aliaghaei[2]

1. Student of 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 : Huntington's disease (HD) is a scarce neurodegenerative disorder defined by chorea (unusual involuntary movements), behavioral presentations, psychiatric features, and cognitive deterioration. Although the precise pathogenic mechanism behind HD has not yet been identified, the most widely acknowledged pathways include excitotoxicity, mitochondrial malfunction, neuroinflammation, neurochemical imbalance, oxidative stress, and apoptosis HD has no efficient therapy. Current medications have drawbacks. Silymarin, a compound made up of standardized extracts obtained from the seeds of the Silybum marianum and polyphenolic flavonolignan, is utilized in therapeutic settings to treat a variety of experimental disorders in animals. Silymarin's key pharmacological activities include anti-cancer, hepatoprotection, antioxidant, cardioprotection, and antiinflammatory. It also has no adverse side effects on people or animals. The current study aims to provide Silymarin's neuro-pharmacological activities or therapeutic qualities in HD.

Methods : In this study, Thirty-six male Sprague- Dawley rats (200–220 g, 8 weeks) at the initial of the study were used. Silymarin solution (100 mg/Kg) was administered by oral gavage for 21 days to ameliorate neural damage in rats injected with 3-nitropropionicacid (3-NP) in a preliminary rat model of HD.

Results : The results showed that administration of Silymarin to HD rats reduced gliosis, improved motor coordination and muscle activity, and increased striatal volume and the number of neurons and glial cells.

Conclusion : Our results suggest that Silymarin provides a protective environment for nerve cells and can have beneficial effects against the harmful effects of HD.

Keywords : Silymarin, Huntington's disease, 3-Nitropropionic acid, Neuroprotection

Count: 361
Abstract ID: 623
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

A Framework for Facial Anonymization in Parkinson's Disease Diagnostic Videos

Submission Author: Seraj Ghasemi

Seraj Ghasemi[1], Hadi Moradi[2]

1. undergraduate student at the University of Tehran, School of Electrical and Computer Engineering, Advanced Robotics and Intelligent Systems Laboratory
2. Professor at School of Electrical and Computer Engineering University of Tehran Tehran, Iran. Adjunct Research Professor, Intelligent Systems Research Institute, SKKU, South Korea Guest editor, Frontiers in Psychology Guest editor, Frontiers in Public Health Editor, IROS 2024 Tel: +98-21-8208-4960 Web: https://ece.ut.ac.ir/en/~moradih Lab: https://aris.ut.ac.ir/en

Background and Aim : In medical research involving Parkinson's disease diagnosis through video analysis, patient privacy protection presents a significant challenge. The visual assessment of Parkinson's symptoms through video recordings has become an important diagnostic tool, allowing medical professionals to observe and analyze patient movements and facial expressions in detail. However, the use of such video data in research settings raises serious privacy concerns, as patients' identifiable information must be protected according to medical data protection regulations. Traditional methods of face blurring or pixelation, while effective for privacy, often destroy valuable clinical information necessary for accurate symptom assessment. This creates a critical need for advanced de-identification techniques that can protect patient privacy while maintaining the visual integrity of disease-specific symptoms.
Methods : After reviewing various approaches, we implemented a modified version of a generative network architecture that allows face replacement while maintaining essential movement characteristics. Our method builds upon recent developments in face swapping technology, adapting it specifically for medical video processing. The system uses an encoder-decoder structure with an identity injection component to replace patient faces with synthetic ones. A key innovation in our implementation is the careful balance between privacy protection and symptom preservation, achieved through specialized loss functions that maintain motion patterns and facial expressions crucial for diagnosis.
Results : Experimental results show that our approach successfully anonymizes patient identities while retaining the clinical validity of the video data for Parkinson's assessment.
Conclusion : This work provides a practical solution for medical researchers to utilize sensitive video data while complying with privacy regulations and ethical guidelines. The method demonstrates potential applications in broader medical research contexts where patient privacy and symptom visualization must be balanced.
Keywords : Face De-identification, Parkinson's Disease, Medical Privacy, Video Processing, Generative Networks

Count: 362
Abstract ID: 701
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

Phytohormone Abscisic Acid Enhances Motor and Cognitive Function in the 3-AP mouse model of Cerebellar Ataxia

Submission Author: Monavareh Soti

Monavareh Soti[1], Mohammad Shabani [2], Hoda ranjbar[3], Mehran Ilaghi[4]

1. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
2. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
3. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
4. Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : Cerebellar ataxia is a debilitating neurodegenerative disorder characterized by impaired motor coordination and balance with limited treatment options. Abscisic acid (ABA), a phytohormone detected in mammalian brains, has neuroprotective properties. This study investigated the effects of ABA on motor, cognitive, and affective deficits in a mouse model of cerebellar ataxia.
Methods : Male Swiss mice received a single intraperitoneal injection of 3-acetylpyridine (3-AP; 60 mg/kg), which decreased climbing fiber input to Purkinje neurons and led to cerebellar degeneration. In ABA-treated groups, ABA (10 or 15 µg/mouse) was intracerebroventricularly applied for four consecutive days. Behavioral testing consisted of open field, footprint analysis, wire grip, rotarod, tail suspension, elevated plus maze, Morris water maze, and the passive avoidance assay. Cerebellar brain-derived neurotrophic factor (BDNF) levels were measured using ELISA.
Results : As expected, 3-AP-treated mice exhibited significant motor impairments, increased anxiety-like and depressive-like behaviors, and cognitive deficits. ABA treatment, particularly at the 15 µg/mouse dose, significantly improved motor coordination, locomotor activity, memory, and spatial and passive avoidance learning as well as reduced anxiety-like and depressive-like behaviors. Behavioral changes were associated with normalization of the 3-AP-induced increases in cerebellar BDNF levels.
Conclusion : This study demonstrates that ABA can ameliorate motor, cognitive, and affective deficits in a mouse model of cerebellar ataxia, which could involve BDNF and be due to neuroprotective effects in the cerebellum. By extension, our data suggest that ABA may have therapeutic potential in the management of cerebellar ataxia and other cerebellar disorders.
Keywords : Abscisic acid, Cerebellar ataxia, 3-acetylpyridine, Cognitive impairments

Count: 363
Abstract ID: 301
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Effect of sleep deprivation on apoptosis, oxidative stress, and motor performance in male Wistar rats

Submission Author: Aysan Akbarnia

Aysan Akbarnia[1], Elmira Beirami[2], Neda Valian[3], Samaneh Nabavi Fard[4]

1. -
2. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Sleep is a natural and physiological process of the mind and body that alters consciousness, reduces muscle activity, and inhibits nearly all voluntary muscles during rapid eye movement (REM) sleep. It is essential for maintaining overall health and well-being, allowing the body to repair itself, consolidate memories, and regulate emotions. One of the most common stressors that has become a problem in modern societies is sleep deprivation.The aim of this study was to investigate the effect of sleep deprivation on motor function and factors involved in oxidative stress, and apoptosis in the striatum of male Wistar rats.

Methods : In this study, rats were divided into 3 groups: control (rats without sleep deprivation), sham (rats placed on a metal plate placed on the columns of the apparatus), and sleep deprived (rats placed on the columns of the apparatus). To induce the sleep deprivation model, the 14-column multiplatform apparatus was used. The rats were placed on the columns of the apparatus from 4 pm to 10 am for 21 days. This apparatus was filled with water up to one centimeter below the surface of the platforms. The method used to induce insomnia in this study was REM sleep deprivation. When the animals enter REM sleep, muscle relaxation causes them to fall into the water and wake up. Pole test was used to assess motor function. The levels of factors involved in apoptosis (BCL2, Bax, and Caspase 3) and oxidative stress (MDA, ROS, and SOD) were measured in the striatum by Western blot and ELISA technique, respectively.

Results : The findings of the behavioral study showed that long-term sleep deprivation resulted in movement disorders in rats. In the pole test, sleep-deprived rats showed a significant increase in total time to reach their cage ($p<0.05$). In addition, long-term sleep deprivation caused oxidative stress response in the striatum of rats by increasing the levels of MDA ($p<0.01$) and ROS ($p<0.01$) factors and decreasing the level of SOD factor ($p<0.05$). Sleep deprivation also led to the occurrence of apoptosis in the striatum of rats by increasing the level of caspase-3 protein ($p<0.001$) and the ratio of Bax/BCL-2 ($p<0.01$).

Conclusion : The results of this study showed that sleep deprivation can lead to movement disorder in rats. It seems that this disorder can be due to an increase in oxidative stress and apoptosis responses.

Keywords : Sleep deprivation, Motor function, Apoptosis, Oxidative stress

Count: 364
Abstract ID: 610
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Poster

The Impact of Transcranial Direct Current Stimulation on Motor and Cognitive Functions in Parkinson's disease: A Narrative Review

Submission Author: Fateme Khari

Fateme Khari[1], Dr Banafshe Mansuri[2], Dr. Seyed Abolfazl Tohidast[3]

1. Student Research Committee, Semnan University of Medical Sciences, Semnan, Iran
2. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran
3. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran

Conclusion : Introduction: Parkinson's disease is a debilitating neurodegenerative disorder that significantly impacts motor and cognitive functions. Traditional treatments often fall short in addressing all symptoms, highlighting the need for innovative approaches such as tDCS, a non-invasive brain stimulation technique. This narrative review examines the effects of Transcranial direct current stimulation (tDCS) on motor and cognitive functions in patients with Parkinson's disease (PD). Through a comprehensive analysis of existing research, we explore the potential benefits, mechanisms, and limitations of tDCS as a therapeutic intervention for PD. Methods: A comprehensive search was conducted in databases such as PubMed, Embase, and Web of Science, focusing on studies published between 2000 and 2024. Peer-reviewed articles, clinical trials, and meta-analyses relevant to tDCS and Parkinson's disease were included. Data extraction involved participant demographics, stimulation parameters, outcome measures, and reported efficacy, with findings synthesized qualitatively to identify common themes and outcomes. Results: The review analyzed 21 key studies involving a total of 736 participants, consistently showing significant improvements in motor functions such as gait speed, stride length, and balance, along with cognitive benefits including enhancements in memory and executive functions. Imaging studies revealed that these improvements were associated with changes in brain connectivity, though variability in stimulation parameters and individual responses highlighted the need for standardized protocols. Conclusion: The effectiveness of tDCS in treating motor and cognitive symptoms of PD was evaluated, showcasing potential advantages and challenges of this treatment modality. Future research directions include optimizing stimulation parameters, exploring long-term effects, and establishing clinical guidelines. tDCS shows promise as a therapeutic intervention for Parkinson's disease, with potential benefits for both motor and cognitive functions. Continued research is essential to refine these techniques and establish their clinical utility.

Keywords : Transcranial Direct trans Stimulation ; Parkinson ; Motor Functions ; Cognitive Functions

Count: 365
Abstract ID: 333
subject: Motor Systems and Movement Disorders: Movement Disorders (Parkinson, Huntington's, ALS, Ataxia, edication-induced Movement Disorders)
Presentation Type: Oral

Neuroprotective effect of human cord blood-derived extracellular vesicles by improved neuromuscular function and reduced gliosis in a rat model of Huntington's disease

Submission Author: Maral Hasanzadeh

Maral Hasanzadeh[1], Reza Bahar[2], Shahram Darabi[3], Mohsen Norouzian[4], Susan Roustaei[5], Kimia Vakili[6], Meysam Hassani Moghaddam[7], Hojjat-Allah Abbaszadeh[8], Abbas Aliaghaei[9]

1. Hearing Disorders Research Center, Loghman Hakim Hospital, 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
3. Cellular and Molecular Research Center, Research Institute for Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran
4. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
6. Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
7. Department of Anatomical Sciences, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran
8. Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
9. Department of Biology and Anatomical Sciences, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aim : This study investigates the therapeutic potential of extracellular vesicles (EVs) in Huntington's disease (HD) using a rat model, and finds that EVs improve functional recovery and reduce HD symptoms. The objective of the study is to investigate the therapeutic potential of EVs derived from HUCB in treating HD by reducing oxidative stress, inflammation, and apoptosis, and improving motor symptoms and neuromuscular function.

Methods : The methods used in this study included ultracentrifugation to prepare EVs from HUCB, rotarod, electromyogram (EMG), and open field tests to evaluate motor function, and histological and immunohistochemical tests to evaluate inflammation and neuronal damage. The methods used in the study included: (1) isolation and characterization of EVs; (2) injection of EVs into rats with HD; (3) behavioral tests, including rotarod and open field tests; (4) histological analysis of the striatum; and (5) measurement of oxidative stress and inflammation markers.

Results : The results showed that HUCB-EVs improved motor function, reduced gliosis, and increased antioxidant activity in a rat model of Huntington's disease. The results of the study showed that EVs improved functional recovery and reduced HD symptoms in rats, including improved motor coordination and neuromuscular function. Additionally, EVs increased the number of neurons and decreased the number of glial cells in the striatum, and reduced inflammation and oxidative stress in the striatum. The results of the study show that EVs treatment demonstrated exceptional antioxidant activities, reduced ROS generation, and restorative benefits on hippocampus neuronal structure, functional deficits, and cognitive decline.

Conclusion : The study concludes that HUCB-EVs have neuroprotective effects and reduce neuroinflammation in a rat model of Huntington's disease, making them a potential therapeutic approach for the treatment of this disease. The study concludes that EVs have therapeutic potential in Huntington's disease, and may be a promising treatment strategy for this disease. The study concludes that EVs derived from HUCB can be a suitable alternative to some of the treatments of HD, and that these structures can play an effective role in controlling inflammation, improving motor symptoms and neuromuscular function.

Keywords : Huntington disease ; Striatum ; Umbilical cord blood; Extracellular vesicles; Neuroprotection; 3NP

Count: 366
Abstract ID: 624
subject: Motor Systems and Movement Disorders: Other
Presentation Type: Oral

parkinson detection using speech game

Submission Author: Saeed Maroof

Saeed Maroof[1], Maziar Emamikhah[2], seyed amir hassan habibi[3], mohammad Rohani[4], reshad hosseini[5], hadi moradi[6]

1. university of tehran
2. Iran University of Medical Sciences
3. Iran University of Medical Sciences
4. Iran University of Medical Sciences
5. university of tehran
6. university of tehran

Background and Aim : Parkinson's disease is considered the second most common neurological disorder in the world, after Alzheimer's disease. According to WHO statistics, both the annual mortality rate and the incidence of this disease are on the rise. Two major factors influencing the likelihood of developing this disease are age and gender. As a person's age increases, the risk of developing Parkinson's disease also rises. Additionally, the disease is more prevalent in men than in women. Parkinson's disease leads to both motor and non-motor problems. These issues include imbalance while walking, hand tremors, digestive problems, and speech difficulties. Research shows that 8 out of 9 patients with Parkinson's disease experience speech-related problems. These issues include lack of voice control, unclear pronunciation of certain words, and slowness in speech. The symptoms of this disease gradually worsen, to the extent that in its later stages, it becomes extremely difficult and sometimes impossible for patients to lead a normal life and perform daily tasks.

Methods : The dataset used in this analysis is an audio dataset collected from a set of patients through a game. The game, which is a voice-based game was designed that works with the "a" vowel sound. In this game, there is a ball that must pass over seven platforms of varying heights, and the player can raise or lower their voice to increase or decrease the ball's height. Two methods were used for feature extraction: time-frequency audio feature extraction and specific audio feature extraction using deep neural networks. In this research, machine learning models and deep neural networks were employed. For machine learning models, random forest, KNN, logistic regression, and SVM were used, as these are common techniques in similar research. Additionally, the YamNet model, a recent model for audio processing, was utilized for the deep neural network. To improve the accuracy and performance, data from the game itself, such as the ball's position on each platform and the time taken to reach each platform, were incorporated alongside the audio data. These models were then combined to train a more effective model.

Results : By using the voice-based game and analyzing its data through the combined models of audio processing and game data processing, we achieved an accuracy of 88% and a recall of 75%. This outcome indicates that out of every four individuals with Parkinson's disease, three could be accurately identified using this voice-based game. This enables individuals to detect the disease before visiting a doctor for periodic check-ups, allowing them to seek confirmation from a specialist.

Conclusion : In this study, we aimed to focus on the speech difficulties of individuals with Parkinson's disease by designing a game and using the game's data for screening the disease. This approach assists specialists in ensuring the accuracy of their diagnosis by providing a simple tool that can be used in any environment. It also helps individuals recognize the onset of the disease before symptoms worsen, thus allowing them to slow the progression of the disease's effects.

Keywords : parkinson detection;speech;artificial intelligent;machine learning

Count: 367
Abstract ID: 286
subject: Integrative system: Neuroendocrinology
Presentation Type: Poster

Hypogonadotropic Hypogonadism in Empty Sella Syndrome in a 24-year-old man: a Case report

Submission Author: Ehsan Adib

Ehsan Adib[1], Anahita Zakeri[2], Shokofeh Banaei[3]

1. Students Research Committee, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran
2. Department of Internal Medicine, Faculty of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran
3. Department of physiology, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran

Conclusion : Introduction: In hypogonadotropic hypogonadism, the testicular tissue remains intact, with the underlying issue residing in the pituitary-hypothalamic axis, resulting in diminished serum levels of testosterone, LH, and FSH and often linked to structural anomalies in the pituitary gland. Empty sella will lead to the compression of the pituitary gland's dense, ball-like tissue against the sella turcica's floor and walls, resulting in MRI images that reveal the sella turcica is empty of the gland. If it becomes symptomatic, it is called empty sella syndrome (ESS). Case: A 24-year-old male patient was referred to the endocrinology clinic. The patient complained of underdeveloped adult sexual characteristics, such as a high-pitched voice, low growth of facial hair, insufficient muscle mass in the limbs and trunk, decreased libido, and irregular nocturnal emission. He had no perinatal complications or other significant health problems, except unilateral Cryptorchidism after delivery, which was resolved. he does not mention any history of similar sexual disorders in the family. He states gynecomastia, and surgery for removal of tissue from both breasts were done. he was overweight (BMI≈29) with abdominal fat distribution. the examination of the genital areas was normal. In ultrasound from the scrotal sacs, the testicles were normal. Hydrocele and varicocele were not seen. In hormonal tests, the serum levels of all three hormones, testosterone(2.2), LH(0.5), and FSH(0.6) have decreased, which indicates hypogonadotropic hypogonadism. The results of other hormones were normal. In semen analysis (SA), the patient's fertility was normal. bone age was over 19 years old, and all the left wrist and hand epiphyseal plates show closure. In the pituitary MRI, evidence of gland height loss and CSF protrusion into sella turcica was seen. gland height was about 2mm. Based on the above results, the empty sella syndrome was eventually confirmed. Androgen replacement therapy was recommended for the patient to reduce the symptoms, help produce and maintain virilization, and prevent future complications. Discussion: Empty sella may be diagnosed in most cases incidentally by a neuroradiologist, during a brain MRI. The majority of individuals diagnosed with ESS are female, with a ratio of 5:1, and they often experience obesity, hypertension, headaches, and visual impairments. The range of symptoms associated with ESS is highly diverse. It can manifest as entirely asymptomatic, posing no issues for the individual throughout their life. Conversely, it may affect multiple axes of the pituitary gland and lead to significant challenges for the patient. Conclusion:The treatment approach for empty sella syndrome should focus on addressing hypopituitarism through

appropriate hormonal replacement therapies and Initiating treatment promptly in cases of ESS is crucial, as early intervention can avert numerous complications for the patient. In endocrine disorders caused by ESS, we must pay attention to the rest of the pituitary axes and take the necessary measures to check these axes annually. The appropriate and rational intervention of doctors in various diseases such as ESS will ensure that the patient does not go to multiple doctors and unnecessary tests are not performed for him.

Keywords : Empty Sella Syndrome; Hypogonadotropic Hypogonadism; Testosterone; Pituitary Gland; MRI

Count: 368
Abstract ID: 171
subject: Integrative system: Neuroendocrinology
Presentation Type: Oral

High-dose Creatine alleviates peripheral diabetic pain and myeline destructions in STZ-induced diabetes in rats

Submission Author: Hosein Ataei

Hosein Ataei[1], Vahid Reisi Vanani[2], Mobina Abdoli[3], Elham Saghaei[4]

1. Student Research Committee, Shahrekord University of Medical Sciences, Shahrekord, Iran
2. Student Research Committee, Shahrekord University of Medical Sciences, Shahrekord, Iran
3. Student Research Committee, Shahrekord University of Medical Sciences, Shahrekord, Iran
4. Department of Physiology and Pharmacology, School of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran

Background and Aim : Peripheral diabetic neuropathy (PDN) is the most prevalent complication of diabetes, significantly impacting patients' quality of life. Current medications can manage only 30-50% of patients' symptoms and do not prevent progressive diabetic sequel. Creatine, abundantly found in brain glial cells, can convert to phosphocreatine, an active form of energy. PDN disrupts the neuronal energy system and impairs myelin production, leading to the development of allodynia. In this study, we aimed to investigate the potential therapeutic effects of creatine on PDN symptoms, myelin thickness, and small neuron density in a streptozotocin-induced PDN model

Methods : Following ethical committee approval, a total of 58 male Wistar rats were randomly assigned to five groups: negative control (CTL), positive control (DM), diabetic controlled with basal insulin (DM+INS), diabetic receiving high-dose creatine (Cr), and diabetic controlled with basal insulin and receiving high-dose creatine (Cr+INS). Diabetes was induced using 52.5 mg/kg of Streptozocin(STZ). The Cr and Cr+INS groups were treated daily with a high dose of creatine (13% of daily food intake) following STZ injection. Neuromuscular coordination and mechanical allodynia were assessed weekly in all rats using the Rotarod test and Von Frey test, respectively. After six weeks, the rats underwent transcardial perfusion-fixation with 10% formalin under deep anesthesia. The sciatic nerve and glabrous skin tissue were extracted and subjected to Toluidine blue and immunofluorescence (IF) staining using a specific antibody against PGP9.5 protein to evaluate myelin thickness and small neuron density. Finally, all study results were analyzed using GraphPad-Prism(9th-ed). Repeated measures Two-way ANOVA or One-way ANOVA with Tukey's post-hoc test was applied as appropriate. Data were presented as mean±SD and mean difference(MD)

Results : Diabetic rats exhibited a significant reduction in pain threshold starting from the third week (MD=5.00, P=0.01), Cr resulted in preventing in allodynia development (50% threshold of 15.02 in Cr vs 8.57 in DM group, P=0.0128). Total Area under curve (AUC) in Von Frey test comparison exhibited significant reduction in DM group compared to CTL and Cr, however DM+INS and Cr+INS comparison showed no statistically significant difference

despite higher threshold in Cr+INS. Rotarod results showed that despite meaningful reduction in DM falling time difference did not reach to statistically significant difference, in addition Cr administration did not show any meaningful effect. IF results showed a significant reduction in skin neuronal intensity, however insulin treatment effectively increased small neuron PGP9.5+ fibers and the most effective results were observed in the Cr+INS combination group. Moreover, Cr effectively increased myeline thickness and additionally combination treatment showed a synergistic effect

Conclusion : Based on our knowledge this was the first study regarding effectiveness of Cr against peripheral neuropathies specifically PDN. High-dose Cr effectively prevented rats' mechanical allodynia, preserved small neuron fibers and myeline thickness. Due to the observed antihyperglycemic effect of Cr in previous studies, we considered a combination group (Cr+INS) in study design with approximately the same HbA1C levels, allowing us to assess whether the effects of Creatine were primarily due to its antihyperglycemic properties or if it provided additional neuroprotective benefits. Consequently, combination treatment resulted in a synergistic effect

Keywords : Diabetic Neuropathies, Creatine, Myelin Sheath, Oligodendroglia

Count: 369
Abstract ID: 149
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

Targeting the Tumor Microenvironment of the Peripheral Nervous System for Cancer Treatment

Submission Author: Gita Tajik

Gita Tajik[1], Faeze Ganjei[2], Mohammad Saleh Safari[3]

1. Veterinary medicine student, Veterinary Faculty, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Veterinary medicine student, Veterinary Faculty, Science and Research Branch, Islamic Azad University, Tehran, Iran.
3. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.

Conclusion : : Although the targeting of the PNS in the TME offers exciting therapeutic potential, challenges remain, including identifying specific neural pathways involved in different cancer types and minimizing side effects associated with nerve-targeting therapies. Future research should focus on refining these approaches, conducting large-scale clinical trials, and integrating PNS-targeting therapies with existing treatment regimens for optimized cancer care. Targeting the peripheral neural tumor microenvironment represents a novel and promising avenue for improving cancer treatment outcomes, offering new hope in addressing tumor resistance and metastasis. Further research is essential to translate these findings into clinical practice.

Keywords : Tumor Microenvironment, Target Therapy, Peripheral Nervous System, Cancer.

Count: 370
Abstract ID: 230
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

Strategies for mRNA-based vaccines in glioma treatment

Submission Author: Sara Seraj

Sara Seraj[1], Mohammad Saleh Safari[2]

1. Veterinary Faculty, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Department of Pathobiology, Faculty of Veterinary, Bu_Ali Sina University, Hamedan, Iran.

Conclusion : mRNA-based vaccines represent a promising new approach for glioma treatment, especially when combined with other immunotherapies like checkpoint inhibitors. While early results are encouraging, challenges remain, including optimizing delivery systems and managing the immunosuppressive tumor microenvironment. Continued research is needed to refine these strategies and assess long-term efficacy and safety in larger clinical trials. The potential for personalized mRNA vaccines tailored to individual glioma mutations could further enhance therapeutic outcomes

Keywords : Glioma, mRNA- vaccines, treatment

Count: 371
Abstract ID: 591
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

A Comprehensive Overview of Brain Cancer Vaccines

Submission Author: FAZEL SAREBANNEJAD

FAZEL SAREBANNEJAD[1]

1. FAZEL SAREBANNEJAD

Conclusion : Summary of Brain Cancer Vaccines Glioblastoma (GBM) stands out as the most aggressive form of primary brain tumor, with survival rates remaining low despite conventional treatments like surgery, chemotherapy, and radiotherapy. To address this, researchers have been exploring the potential of vaccines to stimulate the immune system to target and eliminate cancer cells. Various vaccine types are currently being investigated for their ability to improve outcomes for GBM patients. Dendritic Cell Vaccines (DCVs): One of the most prominent examples is DCVax-L. These vaccines are created by extracting dendritic cells from the patient, loading them with tumor antigens, and then reintroducing them to prompt an immune response. Clinical trials with DCVax-L have shown promising results, with some patients experiencing extended survival. However, larger-scale studies are still needed to confirm these findings in broader patient populations. Peptide-Based Vaccines: These vaccines focus on targeting specific mutations found in tumor cells, such as the epidermal growth factor receptor variant III (EGFRvIII), a common mutation in GBM. The Rindopepimut vaccine has been developed to address this mutation and has shown initial success in stimulating an immune response. Unfortunately, tumor heterogeneity—variations within the tumor—has limited the vaccine's overall effectiveness, allowing the tumor to evade immune detection in some cases. Survivin-Targeted Vaccines: Survivin is a protein that prevents cell death and is overexpressed in GBM and other cancers. Vaccines that target survivin aim to teach the immune system to recognize and attack cells expressing this protein. Early trials suggest that these vaccines can activate the immune system and lead to tumor reduction, though the immunosuppressive environment of GBM presents significant challenges to sustained effectiveness. Combination Immunotherapies: Due to the difficulties posed by GBM's ability to suppress immune responses, combining vaccines with immune checkpoint inhibitors is an area of active research. These inhibitors, like anti-PD-1 and anti-CTLA-4 therapies, block the mechanisms that tumors use to avoid immune detection, and when used alongside vaccines, they show promise in boosting the vaccines' effectiveness. Challenges and Future Directions: Despite these advances, several hurdles remain. The blood-brain barrier makes it difficult for immune cells to reach the tumor, and GBM's immunosuppressive environment complicates the immune system's efforts to sustain a prolonged attack. Current research aims to improve vaccine delivery, strengthen immune response durability, and explore new combinations with other immunotherapies to overcome these challenges. In summary, while cancer vaccines offer a new and promising approach to treating GBM, further research is necessary to address the tumor's unique biology. Combining vaccines with other therapies may be the key to achieving better outcomes for patients in the future.

Keywords : - Glioblastoma (GBM) - Immunotherapy - Cancer vaccines - Dendritic cell vaccines (DCVax-L) - Peptide vaccines (EGFRvIII) - Survivin-targeted vaccines

Count: 372
Abstract ID: 592
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

A Comprehensive Review of Vaccines Developed for Parkinson's Disease

Submission Author: FAZEL SAREBANNEJAD

FAZEL SAREBANNEJAD[1]

1. FAZEL SAREBANNEJAD

Conclusion : Parkinson's disease (PD) is a neurodegenerative condition that progressively impairs motor functions, largely due to the degeneration of dopamine-producing neurons in the substantia nigra. A hallmark of PD is the accumulation of alpha-synuclein, a misfolded protein that aggregates into Lewy bodies. While current treatments like levodopa can help alleviate symptoms, they don't stop the disease from worsening. Recently, researchers have turned their attention to immunotherapy—particularly vaccines aimed at alpha-synuclein—as a potential means to slow disease progression by targeting its root causes. The development of PD vaccines focuses on alpha-synuclein to prevent its toxic buildup and spread. Two key strategies are being explored: active and passive immunization. Active immunization works by encouraging the patient's own immune system to generate antibodies against alpha-synuclein, potentially offering longer-term protection with fewer doses. In contrast, passive immunization involves administering pre-formed antibodies directly into the body, allowing for precise control over dosage but requiring repeated treatments. Several vaccines targeting alpha-synuclein are currently in development. Among them are AFFITOPE PD01A and PD03A, both active vaccines designed to target specific regions of the alpha-synuclein protein. Phase I trials for these vaccines have demonstrated their safety and ability to trigger immune responses, with PD01A producing sustained antibody levels. However, larger trials are necessary to evaluate whether they can effectively slow PD progression. PRX002, a monoclonal antibody developed by Prothena and Roche, represents a passive immunization approach. In Phase I trials, it showed potential by reducing free alpha-synuclein levels in the bloodstream. Preclinical studies have indicated that PRX002 might also reduce alpha-synuclein aggregates in the brain, offering neuroprotection. Phase II trials are underway to assess its long-term benefits for PD patients. Another promising vaccine, UB-312, targets aggregated forms of alpha-synuclein and has shown positive results in animal studies. Early clinical trials are currently testing its safety and the ability to provoke an immune response in humans. Collectively, these vaccines signal a new approach to managing PD by addressing the underlying protein misfolding that leads to neurodegeneration. Despite these advances, there are significant hurdles. The blood-brain barrier, for instance, makes it difficult for antibodies to reach the brain. Moreover, diagnosing PD early enough for a vaccine to be effective is a challenge, as substantial neuronal damage has often already occurred by the time symptoms manifest. Early detection and reliable biomarkers are therefore crucial to improving the success of vaccination strategies. Additionally, it's important that any vaccine selectively targets harmful forms of alpha-synuclein without interfering with its normal functions to avoid unwanted side effects. In

summary, vaccines for Parkinson's disease, particularly those that target alpha-synuclein, represent a promising step toward changing the course of the illness. Early trials have shown that these vaccines are safe and can generate an immune response, but further research is necessary to establish their effectiveness in slowing or halting disease progression. Future work should concentrate on overcoming delivery barriers and improving early diagnostic techniques to fully unlock the potential of PD vaccines.

Keywords : 1. Parkinson's disease (PD) 2. Alpha-synuclein 3. Immunotherapy 4. Vaccines 5. Dopaminergic neurons

Count: 373
Abstract ID: 593
subject: Integrative system: Brain Immune System and Brain Tumors
Presentation Type: Poster

Vaccines Designed Against Alzheimer's Disease: A Comprehensive Review

Submission Author: FAZEL SAREBANNEJAD

FAZEL SAREBANNEJAD[1]

1. FAZEL SAREBANNEJAD

Conclusion : Alzheimer's disease (AD) is a progressively worsening neurodegenerative disorder, distinguished by cognitive decline, memory impairment, and the characteristic presence of amyloid-beta (Aβ) plaques and tau tangles in the brain. Despite available treatments that address symptoms, no current therapies can halt or reverse the course of the disease. Immunotherapy, especially through vaccine development, has emerged as a promising avenue to target AD's core mechanisms, particularly focusing on Aβ and tau proteins, which are central to its pathology. Initial vaccine strategies targeted Aβ. The AN1792 vaccine, aimed at generating an immune response against Aβ plaques, showed success in reducing plaque accumulation in early animal studies but was halted during human trials due to meningoencephalitis, caused by overactive T-cell responses. As a result, second-generation vaccines like CAD106 and UB-311 were designed to limit T-cell activity and reduce adverse effects. These vaccines have demonstrated safety and elicited immune responses, though their ability to slow cognitive decline remains under investigation. Passive immunotherapy, which involves administering monoclonal antibodies, has also been explored. Aducanumab, an antibody targeting aggregated Aβ, gained FDA approval in 2021 for its plaque-reducing effects, although its impact on cognitive improvement is still debated. Other antibodies like Solanezumab and Crenezumab have produced minimal success in clinical trials, showing little cognitive benefit despite reducing amyloid plaques. Due to the limited results from Aβ-targeting approaches, attention has shifted toward tau proteins as an alternative focus. Tau pathology is more closely linked to neurodegeneration and cognitive decline in AD. Vaccines like AADvac1 and ACI-35 are being developed to prevent the buildup of pathological tau or promote its clearance. Early trials have shown these vaccines to be safe and capable of inducing targeted immune responses. Notably, AADvac1 has offered promising results in slowing neurodegeneration in early-stage AD patients. However, several challenges remain in AD vaccine development. A key issue is the need for early diagnosis, as the buildup of amyloid and tau begins long before symptoms appear. Therefore, timely vaccination is critical to maximize effectiveness. Additionally, the blood-brain barrier (BBB) complicates the delivery of therapeutic antibodies to the brain, reducing the impact of these treatments. Researchers are also exploring combination therapies targeting both Aβ and tau, which may offer a more comprehensive approach to managing the disease's complex pathology. In summary, while vaccines targeting Aβ and tau have shown promise in terms of safety and immune response generation, their ability to prevent or slow cognitive decline is yet to be fully established. Moving forward, research should focus on improving early diagnostic methods, developing

biomarkers to monitor disease progression, and finding ways to overcome delivery challenges. Addressing these obstacles could pave the way for AD vaccines to become a viable treatment option in the future.

Keywords : 1. Alzheimer's disease (AD) 2. Amyloid-beta (Aβ) plaques 3. Tau proteins 4. Immunotherapy 5. Vaccines 6. AN1792

Count: 374
Abstract ID: 259
subject: Integrative system: Other
Presentation Type: Oral

Recent Updates on Current and Emerging Therapies for Tinnitus

Submission Author: Mehri Maleki

Mehri Maleki[1]

1. Department of Audiology, School of Rehabilitation Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Conclusion : Based on the latest scientific evidence and documentation, the criteria for choosing the treatment method and their effectiveness among the regular treatments (including cognitive-behavioral therapy, act and mindfulness, psychological counseling, sound therapy and acoustic stimulation, cochlear implantation, etc.) and/or Emerging treatments (electrical stimulation and neuromodulation, photobiomodulation and virtual reality and smartphone applications, etc.) for tinnitus management are discussed. It seems that the usual methods are more effective in managing tinnitus. They also have fewer side effects.

Keywords : Tinnitus; emerging treatments; regular treatments; newest treatment; effectiveness

Count: 375
Abstract ID: 626
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Poster

An in silico approach to identify monoamine oxidase B inhibitory compounds in Echinophora platyloba L. for treating depression disease

Submission Author: AmirAbbas Barzegari

AmirAbbas Barzegari[1], Milad Zare[2]

1. Department of Biology, University of Maragheh, Maragheh, Iran
2. Department of Biology, University of Maragheh, Maragheh, Iran

Background and Aim : Introduction: Medicinal plants are considered as an important source of natural medicines for the treatment of depression. One of the native plants of Iran is Khosharizeh (Echinophora platyloba), which has many uses in traditional medicine. Previous studies have shown that this plant has antidepressant properties. One of the mechanisms through which antidepressants exert their properties is through the inhibition of monoamine oxidase B. The aim of this study was to investigate the molecular docking of the compounds of this plant with monoamine oxidase B to find possible inhibitory compounds of this enzyme in this plant.

Methods : The compounds of E. platyloba were extracted by studying previous articles about the extract and essential oil of this plant. The protein structure of monoamine oxidase B was obtained from the PDB database with the code 2v5z. After preparation of the protein using pymol software, molecular docking of obtained plant compounds and monoamine oxidase B was done with PyRx software package.

Results : The results of the docking study showed that the two compounds isoverbanol acetate and (E)-sesquilavandulol had the highest binding affinity with the active site of the enzyme with the binding affinity of -7.2 and -7.8 kcal/mol, respectively. These results look good compared with the control drug, rasagiline, with binding affinity of -7.8 kcal/mol. Despite this, toxicity study with the ProTox-II web server showed the relative toxicity of these substances in some tests.

Conclusion : In spite of the fact that some beneficial compounds in the plant extract can probably inhibit the monoamine oxidase enzyme, but due to toxicity, they cannot be introduced as drug candidates.

Keywords : Molecular docking; Echinophora platyloba; Monoamine oxidase B

Count: 376
Abstract ID: 418
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Poster

A comprehensive bioinformatics approach to unravel the biological mechanisms underlying Temozolomide resistance in glioblastoma

Submission Author: Maryam Rahnama

Maryam Rahnama[1], Shima Shabani[2], Ali Mohammadian [3]

1. Department of Medical Biotechnology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran
2. Pritzker School of Molecular Engineering, University of Chicago, Chicago, IL, USA
3. Amol University of Special Modern Technologies, Amol, Iran

Background and Aim : Glioblastoma (GBM) is the most common and aggressive brain tumor originating from astrocytes with a low survival rate. Current standard-of-care includes surgical resection, radiotherapy, concomitant, and maintenance temozolomide (TMZ). Although TMZ become a cornerstone of GBM treatment, over 50% of TMZ-treated patients do not respond and it is unfortunately a key factor in tumor resistance and recurrence. This study employed a bioinformatics approach aimed at extracting the critical pathways and biological processes underlying TMZ resistance in a GBM cell line.
Methods : The dataset GSE100736 was obtained from gene expression omnibus (GEO), and differentially expressed genes (DEGs) were identified using the Limma package in R (|logFC|>1 and adj. p-value < 0.05). Significant pathways were then explored through enrichment analysis (FDR< 0.05). Furthermore, the protein-protein interaction network (PPI) was constructed (STRING) and further analyzed using Cytoscape software to identify hub genes and functional modules. Moreover, the upstream regulators of DEGs were identified via GRN analysis. Next, the Log-rank test and Kaplan-Meier analyses were used to assess the difference between survival curves using Gene Expression Profiling Interactive Analysis 2 (GEPIA2).
Results : A total of 5347 down- and 1713 up-regulated genes were found. The down-regs were enriched in VEGFA-VEGFR2 signaling and axon guidance pathways. The up-regs on the other hand, were mainly involved in pathways related to DNA methylation, and vitamin D receptor pathways. Furthermore, the has-miR-770-5p, has-miR-1284, and EGR1, SOX2, and STAT3 transcription factors were found to be key regulators of DEGs. Enrichment analysis of significant modules and hub genes resulted in biological processes known to be involved in GBM pathophysiology. We also found that TMZ could conquer to only 8 of 24 hub genes in various subtypes of GBM by investigating the FC factor.
Conclusion : key molecular contributors to TMZ resistance in GBM were identified in this study which may help find biomarkers for resistance and develop more effective therapeutics.
Keywords : Glioblastoma; Temozolomide; enrichment analysis, survival;

Count: 377
Abstract ID: 221
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Poster

Classifying Cognitive Performance in the 2-Back Task: A Neuroinformatics Perspective on ECoG Data

Submission Author: Mohsen Ghorbani

Mohsen Ghorbani[1], Ehsan Aramide[2], Amir Mohammad Ahmadi[3]

1. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran.
2. Department of Physics, Khajeh Nasir Toosi University of Technology, Tehran, Iran
3. Department of Computer Science, Sharif University of Technology, Tehran, Iran

Background and Aim : Working memory is a cornerstone of cognitive function, playing a critical role in complex tasks such as problem-solving, learning, and decision-making. It allows individuals to hold and manipulate information over short periods, which is essential for adaptive behavior and cognitive performance. The 2-back task is widely used to assess working memory capacity and cognitive load. In this task, participants must determine whether the current stimulus matches one presented two trials earlier. Performance on the 2-back task provides insight into the ability to update and manage information in real time, and is known to decline as cognitive load increases. Errors in this task typically escalate under higher working memory demands, reflecting the challenges of maintaining and processing information. Electrocorticography (ECoG) offers a unique advantage in studying the neural underpinnings of working memory. Unlike non-invasive techniques such as EEG, ECoG provides high temporal and spatial resolution by recording neural activity directly from the cortical surface. This allows for a more precise examination of the brain's response to cognitive tasks. However, distinguishing between correct and incorrect responses, especially under conditions of high cognitive load, remains challenging and an area of ongoing investigation.

Methods : In this study, we analyzed ECoG data from Miller (2019) involving two participants who performed the 2-back task. The primary objective was to differentiate between correct and incorrect responses based on neural activity patterns. The task required participants to identify if the current stimulus matched one from two trials prior. To ensure data quality, preprocessing steps included notch filtering to remove artifacts and z-scoring for normalization. We extracted features such as Power Spectral Density (PSD) entropy, mutual information, and band power across theta, alpha, beta, and gamma frequencies. Given the limited size of the dataset, we employed data augmentation techniques, including time shifting and adding noise, to enhance model training and generalizability. A Support Vector Machine (SVM) classifier was used to distinguish between correct and incorrect responses, and its performance was assessed on both the original and augmented datasets.

Results : The SVM classifier achieved an accuracy of 87% with the original dataset and 84% with the augmented dataset. Although data augmentation slightly reduced accuracy, it significantly improved class balance and model robustness. Analysis revealed that PSD entropy

and theta band power were particularly effective in differentiating between correct and incorrect responses. Statistical tests confirmed that classification performance was significantly better than chance ($p < 0.01$), underscoring the relevance of these features in capturing cognitive load and attentional demands.

Conclusion : Our study demonstrates that ECoG-derived features, when analyzed with machine learning techniques, can effectively distinguish between correct and incorrect responses in the 2-back task. Key features such as PSD entropy and theta power play a crucial role in reflecting cognitive load and working memory function. While data augmentation introduced some variability, it contributed to improved dataset balance and model generalizability. These findings advance our understanding of the neural mechanisms underlying working memory and support the development of real-time cognitive load monitoring systems, with potential applications in various domains including clinical diagnostics and cognitive training.

Keywords : Working Memory; 2-Back Task; Neuroinformatics; Machine Learning; Support Vector Machine (SVM)

Count: 378
Abstract ID: 421
subject: Computational Neuroscience: Neuroinformatics
Presentation Type: Poster

Monitoring and Predicting Cognitive Decline Over Five Years in Parkinson's Disease: A Machine Learning Approach

Submission Author: Ali FathiJouzdani

Ali FathiJouzdani[1], Arman Gorji[2]

1. NAIRG, Department of Neuroscience, Hamadan University of Medical Sciences, Hamadan, Iran
2. NAIRG, Department of Neuroscience, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Parkinson's disease (PD) is an age-related neurodegenerative condition characterized mostly by motor symptoms. Although a wide range of non-motor symptoms (NMS) are frequently experienced by PD patients. One of the important and common NMS is cognitive impairment, which is measured using different cognitive scales. Monitoring cognitive impairment and its decline in PD is essential for patient care and management. In this study, our goal is to identify the most effective cognitive scale in predicting cognitive decline over a 5-year timeframe initializing clinical biomarkers and DAT SPECT.

Methods : Machine Learning has previously shown superior performance in image and clinical data classification and detection. In this study, we propose to use machine learning with different types of data, such as DAT SPECT and clinical biomarkers, to predict PD-CD based on various cognitive scales. We collected 330 DAT SPECT images and their clinical data in baseline, years 2,3,4, and 5 from Parkinson's Progression Markers Initiative (PPMI). We then designed a 3D Autoencoder to extract deep radiomic features (DF) from DAT SPECT images, and we then concatenated it with 17 clinical features (CF) to predict cognitive decline based on Montreal Cognitive Assessment (MoCA) and The Movement Disorder Society-Unified Parkinson's Disease Rating Scale (MDS-UPDRS-I).

Results : The utilization of MoCA as a cognitive decline scale yielded better performance in various years compared to MDS-UPDRS-I. In year 4, the application of the deep radiomic feature resulted in the highest achievement, with a cross-validation AUC of 89.28, utilizing the gradient boosting classifier. For the MDS-UPDRS-I scale, the highest achievement was obtained by utilizing the deep radiomic feature, resulting in a cross-validation AUC of 81.34 with the random forest classifier.

Conclusion : The study findings indicate that the MoCA scale may be a more effective predictor of cognitive decline within 5 years compared to MDS-UPDRS-I. Furthermore, deep radiomic features had better performance compared to sole clinical biomarkers or clinical and deep radiomic combined. These results suggest that using the MoCA score and deep radiomic features extracted from DAT SPECT could be a promising approach for identifying individuals

at risk for cognitive decline in four years. Future research is needed to validate these findings and explore their utility in clinical practice.

Keywords : Cognitive Decline; Machine Learning; MOCA; Parkinson's Disease; UPRDS

Count: 379
Abstract ID: 25
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

The study of brain oscillations with the approach of disease spreading models in inhibitory networks

Submission Author: Mohammad Hoseini Anisi

Mohammad Hoseini Anisi[1], Prf. Alireza Valizadeh[2], Dr. Mozhgan Khanjanianpak[3]

1. Author
2. supervisor
3. advisor

Background and Aim : The excellence of a collection of neurons as the primary structural cells of the brain leads to the generation of brain waves. These waves play a significant role in cognitive processes, making the study of them crucial. One of the modeling methods for these oscillations involves employing disease propagation models. In this project, we utilize a model to describe the brain's neural network, where the dynamics of neurons and synapses interact bidirectionally, such that neurons adhere to a threshold model, and synaptic dynamics are described using a susceptible-infected-susceptible (SIS) model. In this discrete-time approach, neurons become active due to an active noise. Focusing on networks where all neurons are solely inhibitory, we reconstruct neural oscillations in the gamma range and investigate the effects of various parameters such as time delay, stimulation threshold on the network, and observe their impact on the collective behavior of neurons. Increasing the time delay leads to increased synchrony of network activity, reduced oscillation amplitude, and frequency. Additionally, we study the effect of threshold scatter on neuronal activity and its impact on oscillation amplitude, frequency, network synchrony, and neuronal firing rate. We demonstrate that increasing the time delay results in the emergence of gamma oscillations, which align with findings from inhibitory network dynamics and are consistent with existing research results.

Methods : In this study, we simulate brain oscillations within the gamma rhythm range using a fully inhibitory network with a random network structure (Erdős–Rényi,(ER)). We employ threshold dynamics for the neurons and the SIS epidemic spread model for the synapses, where these two dynamics interact with each other. Neurons are connected to one another with a probability p p, which determines the likelihood of connections between them.

Results : The results of this study show that lower values of time delay lead to irregular and desynchronized dynamics. Increasing the time delay improves synchronization, with an intermediate delay of delay = 5 leading to maximum synchronization and the emergence of regular oscillations. If the time delay is further increased, both correlation and frequency decrease. The findings of this study not only provide an explanation for the mechanism of gamma rhythm generation but also clearly demonstrate the details of correlation and the effects of amplitude and frequency. We observed that increasing the standard deviation of neuron thresholds reduces the network's synchronization index under constant time delay.

Conclusion : A relatively simple model for the neural network of the brain has been introduced by combining the dynamics of nodes and edges, taking into account the functioning of neurons and synapses and their bidirectional effects. The results of this research provide a fresh perspective on gamma oscillation generation in neuronal simulations. The role of transmission time delay on the characteristics of gamma rhythm in an inhibitory network is significant. Compatibility of this model with Hodgkin-Huxley, LIF, and Kuramoto neuron models The influence of other important parameters such as the threshold condition of brain neurons' activity in network dynamics and gamma rhythm generation has also been examined.

Keywords : Gamma oscillations, time delay, neuronal activation threshold, disease propagation models

Count: 380
Abstract ID: 148
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Classifying whether a movement is imagery or motory from ECoG datasets using SVM Algorithm for clinical usage in paralyzed, limb amputated and motor deficit patients

Submission Author: Kia Garmabi

Kia Garmabi[1], Dominique Choquette[2], Russell Dougherty[3], Sneha Patel[4]

1. Student Research committee, Kermanshah University of Medical sciences, Kermanshah, Iran.
2. School of Kinesiology, Faculty of Education, University of British Columbia, Vancouver, BC V6T 1Z1, Canada.
3. Department of Psychological Science, University of Vermont, 2 Colchester Ave, Burlington VT 05405, United States.
4. Department of Bioengineering, Stanford University, Stanford, CA, USA.

Background and Aim : Electrocorticography (ECoG) has been critical in the development of brain-computer interface (BCI) powered assistive devices for patients suffering from paralysis, limb amputation, or motor deficits (Moon, Kwon et al. 2024). Developing a system for decoding intended movement from movement imagery using ECoG recordings could allow the use of artificial actuators while preserving the ability to visualize movement. During the 2024 Computational Neuroscience Course of Neuromatch Academy we used one of multiple ECoG datasets from Miller 2019, recorded in a clinical settings with a variety of tasks (Miller 2019). Prior research shows that 8-32 Hz activity in the Alpha and Beta, or low frequency band (LFB), decreases in power during motor movement, while 76-100 Hz Activity in the Gamma, or high frequency band (HFB) increases in power and is involved in coding movement-related parameters such as direction and force (Miller, Schalk et al. 2010). Based on this research, our purpose is to decode executed or imagined movement for clinical use of artificial actuators while preserving the ability to visualize movement so we hypothesized that HFB activity may reflect distinct patterns of neural activity associated with movement, facilitating greater accuracy in decoding these activities than LFB activity.

Methods : We classified actual movement from movement imagery using HFB and LFB features extracted from ECoG recordings obtained from seven epileptic patients during a movement and imagery task. We developed a decoding pipeline for channel selection, feature extraction, and model training to evaluate the performance of classifier models on a dataset composed of 60 imagery and movement trials for each subject. According to this particular ECoG dataset from Miller 2019, We had 7 participants performing hand and tongue extensions with two blocks performed in each subject, that one of them was actual movements and the other one was motor imagery. For the feature extraction we used band pass filtering. Hence, our channels came with 2 features; HFB and LFB, we chose 25 channels with the greatest mean accuracy. Since we couldn’t separate the train data and the test data because of the number of

trials, we did model fitting with K-fold cross-Validation and used Linear Discriminant Analysis, Logistic Regression and Support Vector Machine with linear kernel.

Results : Results indicated that HFB activity provided significantly greater classification accuracy than LFB activity. Preliminary results suggest that of the classifier models evaluated, supported vector machine (SVM) provided the greatest accuracy for both high and low frequency oscillations.

Conclusion : These findings show that movement actuation and imagery can indeed be parsed from motor cortex activity in the gamma frequency range using SVM architecture. Future work should attempt to integrate the developed decoding pipeline into BCI systems for control of prosthetic devices in clinical populations.

Keywords : ECoG; BCI; SVM; brain-computer interface; classification; Computational Neuroscience

Count: 381
Abstract ID: 637
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Assessment of anti-cholinesterase inhibitory activity of Echinophora cinerea bioactive compounds using molecular docking method

Submission Author: AmirAbbas Barzegari

AmirAbbas Barzegari[1], Milad Zare[2]

1. Department of Biology, University of Maragheh, Maragheh, Iran
2. Department of Biology, University of Maragheh, Maragheh, Iran

Background and Aim : One of the important degenerative diseases of the nervous system is Alzheimer's disease, which causes the disability of affected people over time. One of the ways to treat this disease is to increase the level of acetylcholine in the brain by inhibiting the enzyme acetylcholinesterase, because, in this disease, the level of this neurotransmitter in the brain decreases. Previous studies on the use of medicinal plants in the treatment of Alzheimer's disease have been promising. Echinophora cinerea is one of the medicinal plants that is exclusively native to Iran. Considering that medicinal plants contain many bioactive compounds, the purpose of this bioinformatics study was to find possible phytochemicals in the plant that inhibit the acetylcholinesterase enzyme, using the molecular docking method.
Methods : Because the compounds of this plant are not available in the medicinal plants's databases, the plant phytochemicals were obtained by reviewing previous articles about the compounds in the extract and the essential oil of this plant. In addition, the structure of the target protein, acetylcholinesterase enzyme, was extracted from the PDB database with the code 4m0e. Then, the molecular docking of the plant compounds with the active site of this enzyme was performed using the PyRx software package. Finally, the safety of the selected compounds was checked using online databases such as Protox-2.
Results : The results of the molecular docking study showed that isoimperatorin with a binding affinity of -8.4 kcal/mol and osthol with a binding affinity of -8.3 kcal/mol had the highest binding affinity with the active site of the target enzyme. Considering that binding affinity to the active site in the control drug i.e. Donepezil was -8.5, it can be hoped that these two compounds have good medicinal properties in this field. Moreover, using online toxicity assessment servers such as Protox-2 showed the toxicity of these two compounds in some toxicity tests.
Conclusion : Despite the positive results of some compounds of Echinophora cinerea in binding to the active site of acetylcholinesterase enzyme in the molecular docking study, because of their toxicity, these compounds cannot be considered drug candidates in the field of Alzheimer's disease treatment.
Keywords : Echinophora cinerea; acetylcholinesterase; Alzheimer's disease; Molecular docking

Count: 382
Abstract ID: 357
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

False consensus bias in risk attitude prediction

Submission Author: Zahra ArjmandiLari

Zahra ArjmandiLari[1], AmirHossein Tehrani-Safa[2], Atiye Sarab-jamab[3]

1. Independent Researcher
2. School of Cognitive Sciences, Institute for Research in Fundamental Sciences (IPM),Tehran, Iran
3. Faculty of Governance, University of Tehran, Tehran, Iran

Background and Aim : Individuals often falsely believe that others' attitudes and beliefs align more closely with their own than is the case. This phenomenon, referred to as the false consensus bias, has been observed across various social learning contexts. The present study sought to investigate the presence of this bias within the domain of risk attitude prediction, utilizing a Bayesian modeling approach. The hypothesis posited that a model initialized with a prior that mirrors the individual's personal risk attitude would exhibit significantly superior performance in modeling prediction data compared to a model incorporating an unbiased prior, similar to that employed by an ideal Bayesian agent in an uncertain situation.
Methods : We employed a Bayesian learning approach to model participants' predictions of their peers' choices. This involved utilizing a generative probabilistic model and subsequently inverting it using variational Bayes, implemented through the Hierarchical Gaussian Filtering (HGF) toolbox. The model was applied to experimental data from a previous study, where participants had to guess the choices of an artificial agent (impersonating human individuals, known as peers) in accepting a gambling task or receiving a sure reward. As participants received feedback, their posterior estimates of the peer's characteristics could be updated based on social prediction errors, the discrepancy between their predicted and observed peer choices. To assess the influence of different priors, we conducted model comparisons using Variational Bayes Analysis (VBA).
Results : Findings revealed that in line with false consensus bias, individuals tend to start predicting others' behaviors in a manner consistent with their own choices rather than adopting an unbiased approach. A model incorporating a prior equal to the participant's risk attitude demonstrated significantly superior predictive accuracy for prediction choices compared to a model with an unbiased prior (EF=0.93, EP=1).
Conclusion : The present study provides empirical evidence supporting the prevalence of false consensus bias in the context of predicting others' attitudes. Our findings indicate that individuals tend to overestimate the degree of similarity between their risk preferences and those of their peers when faced with uncertainty. A Bayesian model incorporating a participant's risk attitude as a prior significantly outperformed a model with an unbiased prior in predicting peer choices. These results underscore the significance of considering false consensus bias in comprehending social interactions and decision-making processes.
Keywords : Bayesian learning; false consensus bias; social learning; risk attitude; prediction error

Count: 383
Abstract ID: 145
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Oral

Optimizing Theta Burst Stimulation Parameters: Insights from Computational Modeling for Enhanced Brain Neuromodulation

Submission Author: Somayeh Mahmouie

Somayeh Mahmouie[1], Mehrdad Saviz[2], Golnaz Baghdadi[3], Farzad Towhidkhah[4]

1. Biomedical Engineering Department, Amirkabir University of Technology (Tehran polytechnic)
2. Biomedical Engineering Department, Amirkabir University of Technology (Tehran polytechnic)
3. Biomedical Engineering Department, Amirkabir University of Technology (Tehran polytechnic)
4. Biomedical Engineering Department, Amirkabir University of Technology (Tehran polytechnic)

Background and Aim : Theta Burst Stimulation (TBS) is a cutting-edge technique in neuromodulation. It provides a non-invasive method to influence brain activity and has promising applications in both clinical treatments and cognitive enhancement. TBS consists of three pulses at gamma frequency (50Hz) that repeat every 200ms (theta frequency). Although TBS has proven effective in inducing long-term potentiation (LTP) and depression (LTD) in the motor cortex, its full potential remains unexplored due to less-than-optimal parameter settings. Different parameters, such as pulse frequency and stimulation intensity, can significantly influence neural plasticity and therapeutic outcomes. Therefore, understanding the mechanisms of TBS is essential for advancing clinical and research applications in cognitive neuroscience. This study addresses this gap by introducing a refined mathematical model to explore how adjusting these parameters can enhance TBS's efficacy, paving the way for more precise and effective neuromodulation techniques.
Methods : The proposed mathematical model, which modifies Huang's model, is based on the principles of the glutamatergic synapse. In this model, post-synaptic Ca2+ entry triggers processes that result in varying levels of potentiation and depression of synaptic transmission. The ultimate impact on the synapse is achieved by merging these two effects. As mentioned earlier, TBS involves two distinct frequencies. Therefore, our initial step involves examining the impact of varying the frequency between bursts and identifying the frequency range that produces the greatest after-effect. In the second step, we identify the optimal frequency between pulses
Results : The results indicate that shifting from theta frequency to alpha frequency enhances the after-effect. Therefore, we selected an alpha frequency of 10 Hz as the burst frequency. Furthermore, the findings suggest that beta frequency produces more significant after-effects compared to gamma frequency when determining the optimal frequency between pulses.
Conclusion : In addition to changing the number of pulses and stimulation intensity, altering the frequency can also increase the therapeutic effects
Keywords : theta burst stimulation, mathematical model, change frequencies of TBS

Count: 384
Abstract ID: 620
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Design and Simulation of Magnetoelectric Sensors for High-Resolution, Non-Invasive Brain Mapping: A FEM-Based Approach

Submission Author: Meisam Haghparast

Meisam Haghparast[1], Parya Abravani[2]

1. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran
2. Institute for Cognitive and Brain Sciences, Shahid Beheshti University, Tehran, Iran

Background and Aim : Magnetoelectric (ME) sensors have emerged as promising tools for non-invasive brain mapping due to their high sensitivity and ability to detect weak magnetic fields generated by neuronal activity. These sensors operate based on the magnetoelectric effect, where an applied magnetic field induces an electric current, enabling the detection of brain signals and the creation of a brain map. Compared to traditional techniques like SQUID-based magnetoencephalography (MEG), magnetoelectric sensors offer advantages in terms of miniaturization, lower power consumption, and enhanced spatial resolution. In this article, we used the finite element method to simulate the principles of magnetoelectric sensors and their use in brain mapping. Magnetoelectric sensors hold significant promise for the future of neuroscience, providing a new avenue for detailed and accurate mapping of brain activity.

Methods : THE ME composites have the ability to convert magnetic fields into electrical currents, making them ideal for applications such as magnetic field sensors and MEG scanners. We used Comsol Multiphysics software and the finite element method (FEM) to simulate a specific composite structure. This structure consists of Galfenol alloy as the magnetostrictive material, PZT as the piezoelectric layer, and silicon as the substrate. The operating frequency and sensitivity of these composites are critical for their use as MEG scanners. Our simulations enabled us to identify a structure with the optimal frequency and sensitivity, positioning it as a suitable candidate for MEG sensor applications.

Results : By employing etched cantilever-shaped structures and galfenol nanostructures, we successfully designed and developed the desired sensor through computer simulations. The magnetoelectric coefficient of this structure is 648 ($V.cm^{-1}.Oe^{-1}$), which enables it to detect magnetic fields as weak as the femto-tesla level generated by the human brain. Additionally, the sensor operates at a frequency below 100 Hz, corresponding to the structure's first resonance mode. One of the key advantages of this sensor is its ability to function at room temperature, thus eliminating the need for cooling systems. Its compact size, due to the applied dimensions, also makes it a MEMS device, ideal for integration into small-scale systems. This combination of high sensitivity, compactness, and practicality positions the sensor as a promising tool for biomedical applications.

Conclusion : Magnetoelectric sensors represent an innovative approach to non-invasive brain mapping, offering distinct advantages over traditional techniques like SQUID-based magnetoencephalography. In this study, finite element simulations demonstrated that these sensors, composed of Galfenol alloy, PZT layers, and silicon substrates, are capable of detecting extremely weak magnetic fields generated by neuronal activity. The cantilever-shaped design, along with the sensor's high magnetoelectric coefficient and ability to operate at room temperature, suggests significant potential for neuroscience applications. Unlike traditional methods, these sensors do not require cooling and are compatible with MEMS technology, making them practical, efficient, and miniaturized solutions for high-resolution brain mapping. As such, they hold great promise for advancing the future of neuroscience research.

Keywords : Magnetoelectric; brain mapping; Finite element method (FEM); computational neuroscience; Magnetoencephalography (MEG)

Count: 385
Abstract ID: 8
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Potential Therapeutics for Inflammatory Mechanisms in Neurodegenerative and Infectious Diseases: Evaluating Ketoprofen, Thalidone, and Cromolyn in ALS, MS, and Sepsis

Submission Author: Fatemeh EmamiPari

Fatemeh EmamiPari[1], Amir Sabbaghian[2], Mahdi Aalikhani[3]

1. Molecular Diagnostics Research Group, School Of Advanced Technology in Medicine, GOUMS, Gorgan, Iran
2. Ningbo Institute of Life and Health Industry, Ningbo, China
3. Assistant Professor of Medical Biotechnology School of Paramedicine, Bushehr University of Medical Sciences (BPUMS), Bushehr, Iran

Background and Aim : Inflammation is a key component in all three conditions. In MS, inflammation results from the autoimmune response. In ALS, neuroinflammation is thought to play a role in neuronal damage. In sepsis, the body's response to infection leads to systemic inflammation, which can cause multiple organ systems to fail. Therefore, in this study, we aimed to investigate possible therapeutic options for the concurrent treatment of ALS, MS, and sepsis.

Methods : Differential gene expression analysis (DEG) was performed on datasets obtained from patients diagnosed with ALS, MS, and sepsis. The raw RNA sequencing datasets were obtained from the GEO database. Differentially expressed genes from each disease group were compared to the related controls. Genes with an increased expression that were common to all three groups were selected. We studied the gene ontology (GO) and molecular functions of DEGs. The most influential proteins involved in these diseases were selected based on GO, molecular function, and cellular location. Finally, molecular docking was performed to identify drugs with the ability to suppress proteins involved in the three diseases.

Results : In total, 43 DEGs (23 upregulated and 20 downregulated) were identified, which were abnormally expressed in patients with ALS, MS, and sepsis compared to healthy individuals. GO analysis demonstrated that most upregulated DEGs were significantly enriched in the cellular response to zinc ions, MHC class II complex, and zinc ion homeostasis. Seven upregulated DEGs were selected based on their connectivity in protein-protein interactions. Finally, CMPK2 and IFI44L were selected for molecular docking because their expression levels were increased in all three diseases. Three drugs, ketoprofen, thalitone, and cromolyn, have been identified against the CMPK2 and IFI44L proteins with a binding affinity greater than -8 kcal/mol.

Conclusion : It's important to recognize that while inflammation is a common thread among these conditions, the source, mechanisms, and implications of the inflammatory processes are

different for each disease. Therefore, while they can be grouped together for their involvement of inflammatory processes, their treatment, progression, and outcomes can be vastly different.

Keywords : Drug repurposing; amyotrophic lateral sclerosis; multiple sclerosis; sepsis; RNA-Sequencing.

Count: 386
Abstract ID: 697
subject: Computational Neuroscience: Modeling and Simulation
Presentation Type: Poster

Assessing the effect of Brain Tumor on EEG Source Localization Using Realistic Head Models, A Simulation-Based Analysis

Submission Author: Saeid Ghazanfarishabankareh

Saeid Ghazanfarishabankareh[1], Kamran kazemi[2], Negar Noorizadeh[3], Ardalan Aarabi[4]

1. 1 Department of Electrical and Electronics Engineering, Shiraz University of Technology
2. 1 Department of Electrical and Electronics Engineering, Shiraz University of Technology
3. 2 Department of Pediatrics, University of Tennessee Health Science Center, Memphis, TN, USA. 3 Neuroscience Institute, Le Bonheur Children's Hospital, Memphis, TN, USA.
4. 4 Laboratory of Functional Neuroscience and Pathologies (UR-UPJV 4559), University Research Center, University Hospital, Amiens, France. 5 Faculty of Medicine, University of Picardy Jules Verne, Amiens, France.

Background and Aim : Electroencephalography (EEG) source localization is a crucial technique in neuroscience and clinical practice for identifying the sources of neural activity within the brain. Accurate localization is essential for understanding brain function, diagnosing neurological disorders, and planning treatments such as brain surgery or neurostimulation. Structural anomalies, like brain tumors, can alter the head's electrical properties, potentially compromising the accuracy of EEG source localization. This study investigates the impact of brain tumors on localization accuracy using a simulation-based approach. By incorporating realistic head models, we assess how tumor-induced geometric variations affect the localization of neural sources.

Methods : To investigate source localization errors induced by brain tumors, we utilized a brain tumor simulator to generate two realistic head models. Each model included the following tissues: scalp ($\sigma = 0.33$ S/m), skull ($\sigma = 0.04$ S/m), gray matter ($\sigma = 0.33$ S/m), white matter ($\sigma = 0.33$ S/m), cerebrospinal fluid ($\sigma = 1.79$ S/m), tumor ($\sigma = 0.96$ S/m), and surrounding edema ($\sigma = 0.77$ S/m). The tumor occupied approximately 3% of the total brain volume and was positioned in the left and right frontal regions, which are common sites for tumor occurrence. The models were derived using MRI data to ensure anatomical accuracy. To assess the effect of tumor geometry on EEG source localization errors, EEG forward solutions were computed through numerical simulations using a normal head model with dipolar sources uniformly distributed across the cortex and oriented normally to the cortical surface. For each source, the inverse problem was solved using the finite element method (FEM) with head models that included tumors, using the SimBio-NeuroFEM toolbox in Fieldtrip, and 88 electrodes positioned according to the 10-10 standard EEG electrode placement system. The source localization error was then computed as the difference between the locations of the original sources (on the normal head model) and the estimated sources (on the tumor-included models) for sources within the tumor, edema, and those relatively distant from the tumor sites.

Results : The average localization error for sources located within the tumor regions in both tumor-included models was 5.5 ± 2.59 mm. For sources within the edema regions, the average localization error was 2.97 ± 1.73 mm. In contrast, for sources positioned in areas distant from the tumor, the localization error was 2.09 ± 1.95 mm.

Conclusion : Our findings indicated a higher localization error for sources within the tumor compared to those in surrounding or distant areas, emphasizing the impact of the tumor-induced changes in geometry on the accuracy of EEG source localization.

Keywords : EEG forward and inverse solution; Source localization error;Realistic head model; Tumor.

Count: 387
Abstract ID: 372
subject: Computational Neuroscience: Network Models
Presentation Type: Poster

Information flow in the functional brain networks of ASDs vs Controls by transfer entropy approach

Submission Author: MohammadAmin Safaei

MohammadAmin Safaei[1], Abolfazl Haghighifar[2], Reza Jafari[3]

1. Department of Physics, Shahid Beheshti University, Tehran, Iran
2. Department of Physics, Shahid Beheshti University, Tehran, Iran
3. Department of Physics, Shahid Beheshti University, Tehran, Iran

Background and Aim : Autism Spectrum Disorder (ASD) impacts how the brain processes and transfers information, and understanding these differences is key to uncovering the disorder's underlying mechanisms. While earlier studies have used methods like Granger causality to examine brain connections, those approaches focus mainly on how brain regions affect each other, without fully capturing the complex, dynamic nature of those connections . In our study, we used a more advanced method called transfer entropy (TE) to dig deeper. TE doesn't just show which areas are connected—it reveals how information flows between them, especially in non-linear systems like the brain . By doing this, we aim to provide new insights into the unique brain activity patterns seen in people with ASD.

Methods : We used data from the Autism Brain Imaging Data Exchange II (ABIDE II), which included resting-state fMRI scans from 1114 people—530 diagnosed with ASD and 505 without, ranging in age from 5 to 64. To ensure the data was reliable, we processed it thoroughly before focusing on eight major brain networks: Default Mode, Dorsal Attention, Frontoparietal, Limbic, Somatomotor, Subcortical, Ventral Attention, and Visual. These networks are crucial for cognitive and emotional functions. We used TE to measure how information is exchanged between different regions within these networks, comparing individuals with ASD to healthy controls. To visualize the differences in information flow, we created violin plots, and we used statistical tests to confirm if the differences were significant.

Results : Our analysis showed differences in how information flows through the brains of people with ASD compared to controls. Acknowledging the fact that the activity of different subregions within a specific network is interconnected; higher transfer entropy (TE) values reveal a stronger causal relationship between regions, suggesting more effective information transmission. The most striking changes were in the Limbic system, which plays a major role in emotional regulation, suggesting that information flow in this area is significantly altered in ASD. Additionally, within the Ventral Attention network, some regions exert a stronger influence on other regions in healthy controls compared to the same subregions in individuals with ASD. Other networks, like the Default Mode and Somatomotor, also showed differences, though to a lesser extent. These findings suggest that the brains of people with ASD transfer information differently, especially in areas related to emotions and learning.

Conclusion : This study sheds light on the unique ways that information flows in the brains of people with ASD. By using transfer entropy, we recognized that in individuals with ASD, certain subregions influence the activity of other subregions more effectively than those same subregions do in healthy controls; especially in the Limbic system. This could potentially help explain some of the emotional and cognitive challenges faced by individuals with ASD. The obtained results offer a new perspective on how ASD affects brain function.

Keywords : Autism Spectrum Disorder; Brain Network; Transfer Entropy; Information Flow

Count: 388
Abstract ID: 244
subject: Computational Neuroscience: Network Models
Presentation Type: Poster

Optimizing the protocol for inducing long-term synaptic strengthening in an animal model of Alzheimer's disease using artificial intelligence

Submission Author: Nasrin Hosseini

Nasrin Hosseini[1], Haleh Fateh[2], Seyyed benamedine Jameie[3], Mojtaba Khayat Ajam[4], Mona Farhadi[5], Hesameddin Allameh[6]

1. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran.
2. Lifestyle medicine Research Group, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran.
3. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran.
4. Lifestyle medicine Research Group, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran.
5. Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran.
6. Lifestyle medicine Research Group, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran.

Background and Aim : Introduction: Alzheimer's is a neurodegenerative disease associated with memory impairment. Now artificial intelligence is widely used in scientific research and research in basic and medical sciences. Animal studies are important tools in better understanding, diagnosis and treatment of diseases. On the other hand, conducting these studies requires a lot of time and money, and researchers are trying to reduce them. Therefore, the present study was conducted to optimize the long-term synaptic strengthening induction protocol in the animal model of Alzheimer's disease using artificial intelligence.

Methods : In this study, electrophysiological data obtained from male Wistar rats in the control, surgical and Alzheimer's groups were used. An animal model was created by destroying the NBM nucleus by the toxin ibotenic acid. The used protocol was determination of the Mean Slope of Excitatory postsynaptic potential (0.1 Hz) with Intensities of 100-1000 mA (Slope 100-1000 mA), and determination of the mean slope of the excitatory postsynaptic potential (slope) obtained from stimulation at a frequency of 400 Hz (10 bursts out of 200 stimuli, duration of each stimulation is 0.2 ms and intervals between bursts is 10 seconds) (B4 and slop B3 recorded before tetanus stimulation). Finally, determination of the Mean Slope of Excitatory Postsynaptic Potential (Slope) of 400 Hz Stimulation (10 Bursts out of 200 stimulation, duration of each stimulation 0.2 ms and Intervals of 10 Seconds) at 30, 60 and 120 minutes after Tetanus stimulation. The comprehensive and detailed analysis was done using the Python programming language

Results : Based on the results, it seems that in the protocol used in this study, the evaluation of the slope and amplitude of the EPSP curve in neuronal registration before LTP induction

will not have a significant effect on the results, and according to the study conditions, the mentioned steps can be removed from the LTP induction protocol.

Conclusion : By using the criteria to evaluate the importance of features, variables with high importance are identified, and in this process, it is possible to eliminate variables of low importance. This elimination not only helps the model fit, but also leads to cost reduction.

Keywords : LTP; artificial intelligence; Alzheimer's disease

Count: 389
Abstract ID: 143
subject: Computational Neuroscience: Network Models
Presentation Type: Oral

Deep learning for early Alzheimer's Disease diagnosis

Submission Author: Zohre Moattar Husseini

Zohre Moattar Husseini [1], Abbas Ahmadi[2]

1. Department of Industrial Engineering & Management Systems, Amirkabir University of Technology, Tehran, Iran
2. Department of Industrial Engineering & Management Systems, Amirkabir University of Technology, Tehran, Iran

Background and Aim : Alzheimer's Disease (AD) is the leading cause of dementia worldwide, progressing steadily from mild to severe and ultimately hindering an individual's ability to perform daily tasks independently. Existing approaches to classify AD stages incorporate medical history, neuropsychological testing, genetic factors, and neuroimaging including Magnetic Resonance Imaging (MRI). The application of Deep Learning (DL) to the early diagnosis and automated categorization of Alzheimer's Disease has garnered significant attention in recent years. Recent advancements in deep learning and neuroimaging have shown promise in medical applications.

Methods : This study initially provides a comprehensive review of research using deep learning techniques and MRI data for AD classification. Subsequently, a DL technique, specifically a Convolutional Neural Network (CNN) model is employed to facilitate earlier diagnosis and classification of Alzheimer's Disease. The proposed CNN considers optimized parameters to identify AD stages.

Results : The model's performance, evaluated on the Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset, demonstrates remarkable accuracy. Also, the obtained results are compared with traditional machine learning algorithms, where the findings suggest that deep learning approaches may be more advantageous when dealing with large-scale medical data.

Conclusion : The present study provides effective results and valuable insights into the current limitations and future prospects of the diagnostic approach based on CNN for Alzheimer's Disease.

Keywords : Deep learning; Alzheimer's Disease; MRI image; convolutional neural network

Count: 390
Abstract ID: 280
subject: Computational Neuroscience: Network Models
Presentation Type: Poster

Harnessing Artificial Intelligence for Predictive Modeling in Dysphagia Management: A Systematic Review of Aspiration Risk Assessment

Submission Author: Ebrahim Kheirabadi

Ebrahim Kheirabadi[1], Nasim Masoumi[2], Jalal Bakhtiyari[3]

1. Department of Speech Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Speech Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Speech Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran

Conclusion : Objective: Aspiration, a serious complication of dysphagia, can cause pneumonia and other life-threatening issues. Traditional diagnostic methods like VFSS and FEES are limited by invasiveness, discomfort, and inconsistent accuracy. Artificial Intelligence (AI) offers a potential solution by improving aspiration risk assessment through analysis of clinical and imaging data. This study aims to evaluate the role of AI in enhancing predictive modeling for aspiration risk, improving decision-making, and reducing related complications. Methods: A comprehensive literature review was conducted using databases like PubMed, Scopus, Web of Science, and ScienceDirect. The search focused on AI applications in aspiration risk prediction and dysphagia management. Studies from the past decade were included, prioritizing peer-reviewed research. Exclusion criteria involved non-peer-reviewed studies and those unrelated to AI or aspiration risk. Key areas of focus included machine learning algorithms, predictive models, and their clinical implications in managing dysphagia. Results: AI models, particularly machine learning algorithms like Random Forests, Support Vector Machines, and neural networks, have shown promising results in predicting aspiration risk in dysphagia patients. These models effectively analyze patient history, clinical assessments, and imaging data, demonstrating improved accuracy over traditional methods such as Videofluoroscopic Swallow Studies (VFSS) and Fiberoptic Endoscopic Evaluation of Swallowing (FEES). AI also supports personalized risk profiles and real-time patient monitoring. Conclusions: This study aimed to assess AI's role in improving aspiration risk prediction in dysphagia. AI models demonstrated greater accuracy than traditional methods like VFSS and FEES, providing personalized risk assessments and enabling timely interventions. AI integration can reduce complications, optimize care, and minimize hospital readmissions. Future research should focus on validating AI models through clinical trials and addressing challenges like data quality and clinical integration.

Keywords : Artificial Intelligence; Dysphagia; Predictive Modeling; Aspiration Risk; Machine Learning

Count: 391
Abstract ID: 422
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

PerPsych: An iPadOS-based open-source neuropsychological software for time perception assessment Authors

Submission Author: Ali FathiJouzdani

Ali FathiJouzdani[1], Arman Gorji[2]

1. NAIRG, Department of Neuroscience, Hamadan University of Medical Sciences, Hamadan, Iran
2. NAIRG, Department of Neuroscience, Hamadan University of Medical Sciences, Hamadan, Iran

Background and Aim : Time perception is an important aspect of cognitive function that can be affected by mental illness and brain disease. Neuropsychological tests often assess time perception using computer displays, but smartphone or tablet software may offer some advantages.

Methods : In this study, we present PerPsych, an open-source, iPadOS-based neuropsychological tool for testing time perception.

Results : PerPsych has the following features: It is designed natively for iPadOS, using the low-level Metal interface to access the graphics processing unit for high-timing performance. It allows researchers to conduct studies on time perception in individuals with cognitive impairment using a simple and user-friendly interface. It supports various experimental paradigms and parameters for measuring time perception, such as duration estimation, production, and reproduction.

Conclusion : In conclusion, the PerPsych software presents an efficient, user-friendly, and open-source tool designed for assessing time perception on iPadOS devices. By utilizing advanced hardware capabilities like the Metal interface, it delivers high-timing accuracy essential for neuropsychological and psychophysical tests. This application, with its explicit and implicit timing tests, provides a portable, cost-effective alternative to traditional lab-based setups, enabling broader access for research and clinical use. Its potential for large-scale data collection may further enhance AI-driven predictions for cognitive impairments.

Keywords : iPadOS; Neuropsychological; Open-source; Time perception

Count: 392
Abstract ID: 684
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Common hub genes and pathways between Parkinson's disease and Epilepsy: A 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 : Introduction: Parkinson's disease is one of the most common disorders in the senior population, and it frequently involves the substantia nigra. Also, Epilepsy is another chronic central nervous system illness characterized by a neuronal electrical imbalance. On the other hand, the signaling pathways and linked shared genes between Parkinson's disease and epilepsy are yet unknown. As a result, we investigated the common molecular pathways between them.

Methods : Material and method: This study took integrated bioinformatics analysis with two expression datasets GSE28674 and GSE23290, downloaded from Gene Expression Omnibus (GEO) database were included CA3 explants surgically obtained from patients with epilepsy and samples from putamen brain tissue from idiopathic Parkinson's disease patients, 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 : Results: Nine upregulated DEGs; SH3GL2, LMO7, NMNAT2, IQSEC2, YWHAH, PGM2L1, TUSC3 and ITPR1 were shown to be linked to epilepsy and Parkinson's disease. With significant enrichment analysis it is shown that they were involved in calcium homeostasis and synaptic vesicle endocytosis.

Conclusion : Conclusion: We identified the common prospective genes and pathways between Parkinson's disease and epilepsy. Understanding these conjoint items will evolve our knowledge about the hereditary and idiopathic disease-relate etiologies in this two important neurological conditions. Thus, investigating these genes and pathways is a valuable clue in future clinical studies to improve the prognosis and raise our current treatment quality.

Keywords : epilepsy; neurodegenerative diseases; Parkinson's disease; hub genes; pathways; bioinformatics analysis;

Count: 393
Abstract ID: 210
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

A Comprehensive Review of Medical Image Processing Techniques for Alzheimer Diagnosis

Submission Author: Sogand Abbasi Azizi

Sogand Abbasi Azizi[1], Reza Erfani Far[2]

1. Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran.
2. Resident of Neurology, Department of Neurology, Rasoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran.

Conclusion : Alzheimer's disease remains one of the most challenging progressive neurodegenerative disorder that is a leading cause of dementia worldwide. Early and accurate diagnosis is crucial for timely intervention and better patient outcomes. Recent years have seen remarkable progress in the application of advanced image processing techniques to aid in AD diagnosis. Early and accurate diagnosis of Alzheimer's is critical for providing appropriate treatment and care for patients. In recent years, the use of medical imaging techniques has become increasingly important for the diagnosis and monitoring of Alzheimer's disease. This paper provides a comprehensive review of the medical image processing techniques for Alzheimer's diagnosis. The review covers a range of imaging modalities including magnetic resonance imaging (MRI), and computed tomography (CT. It examines the various image processing and analysis methods that have been developed, including segmentation techniques such as atlas-based segmentation and machine learning-based segmentation, registration methods like deformable image registration, feature extraction approaches including voxel-based morphometry and cortical thickness analysis, and classification algorithms such as support vector machines and deep neural networks. The review also discusses the challenges and limitations of current imaging-based Alzheimer's diagnostic approaches, including issues related to image quality, anatomical variability, and the interpretability of complex machine learning models. Additionally, it highlights promising future directions for research and development in this critical area of medical imaging analysis, such as the integration of multimodal imaging data, the use of generative models for data augmentation, and the development of explainable AI systems for improved clinical interpretability. Overall, this review aims to provide researchers and clinicians with a thorough understanding of the role of medical image processing in Alzheimer's diagnosis and management.

Keywords : Alzheimer's disease, medical image processing, machine learning, deep learning, Alzheimer's diagnosis.

Count: 394
Abstract ID: 305
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Identification of Key Modules and Pathways in Glioblastoma Multiforme Based on Weighted Gene Co-expression Network Analysis (WGCNA)

Submission Author: Maryam Hoseinpour

Maryam Hoseinpour[1], Shahram Teimourian[2], Zohre Moattar Husseini[3]

1. Department of Medical Genetics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Medical Genetics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
3. Department of Industrial Engineering and Management Systems, Amirkabir University of Technology, Tehran, Iran

Background and Aim : Glioblastoma multiforme (GBM), is recognized as the most aggressive form of primary brain tumor. GBM is distinguished by significant invasiveness, elevated recurrence rates, diminished survival rates, and poor prognostic outcomes, with a median survival duration ranging from 12 to 15 months. The exact molecular mechanisms associated with the pathogenesis and progression of GBM are yet to be established. This bioinformatic research aims to identify and predict key genes and signaling pathways related to this challenging condition.

Methods : First, we retrieved RNA-seq data (GSE165595) from the Gene Expression Omnibus (GEO) database. To discern the genes differentially expressed between GBM and control samples, we employed the Weighted Gene Co-expression Network Analysis (WGCNA) method. Using this approach, modules were recognized with distinct expression patterns in GBM. Next, we performed functional enrichment analysis and protein interaction network construction on genes with the highest correlation in the turquoise module.

Results : Our results reveal the utility of WGCNA in detecting genetic drivers and elucidating genetic pathways represented by gene modules. We identified 547 genes in the turquoise module. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analyses presented that the genes within the turquoise module were significantly associated with synaptic signaling, regulation of ion transport, and nervous system process pathways.

Conclusion : This study may contribute to a deeper understanding of the molecular mechanisms of GBM and be effective in identifying diagnostic and therapeutic targets in the future.

Keywords : glioblastoma multiforme; module; WGCNA; gene ontology; pathway enrichment

Count: 395
Abstract ID: 219
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Target Frequency Recognition in Steady-State Visually Evoked Potentials Using Visibility Graph Similarity Analysis

Submission Author: Sepehr Kalanaki

Sepehr Kalanaki[1], Farnaz Ghassemi[2], Zahra Tabanfar[3]

1. Amirkabir University of Technology, Department of Biomedical Engineering, Tehran, Iran
2. Amirkabir University of Technology, Department of Biomedical Engineering, Tehran, Iran
3. Amirkabir University of Technology, Department of Biomedical Engineering, Tehran, Iran

Background and Aim : Motor disabilities caused by conditions such as spinal cord injuries, strokes, or neurological disorders can significantly impair an individual's ability to interact with their surroundings. Brain-Computer Interface (BCI) systems present a promising solution by translating neural activity into control signals for external devices. Among the different BCI techniques, Steady-State Visual Evoked Potentials (SSVEPs) are highly regarded due to their reliability and efficient information transfer. SSVEPs are brain responses elicited when an individual focuses on a flickering visual stimulus, measurable through Electroencephalography (EEG). However, traditional SSVEP detection methods, including Fast Fourier Transform (FFT) and Canonical Correlation Analysis (CCA), often face limitations with signal complexity and noise, which can compromise accuracy and real-time application. These limitations underscore the need for advanced detection techniques. In this study, we introduce the Visibility Graph (VG) algorithm as a novel approach to enhance SSVEP detection accuracy and robustness by converting time-series data into complex networks.

Methods : The dataset used in this research consists of EEG signals collected from five participants across 16 channels while they focused on visual stimuli flickering at four distinct target frequencies (5–8 Hz). Preprocessing steps included the removal of noise and unwanted frequency components, such as power line interference. The innovative technique proposed in this study, Visibility Graph Similarity Analysis (VGSA), leverages the fact that the VG of an SSVEP signal closely resembles that of a pure sinusoidal signal. Given that SSVEP signals contain a sinusoidal component at the target frequency, we hypothesized that the VG of an SSVEP signal would most resemble the VG of a pure sinusoid at the correct target frequency. In VGSA, time-series data are transformed into binary adjacency matrices, where non-zero entries represent visible connections (edges) between points in the time series. The similarity between graphs is assessed using measures like the Jaccard similarity, which calculates the ratio of shared edges to total edges across both graphs. SSVEP signal analysis was conducted using various window lengths, incorporating harmonic combinations (1st, 2nd, and both harmonics), with results evaluated on raw and filtered data (4–9 Hz and 9–17 Hz to retain the 1st and 2nd harmonics).

Results : The VGSA method achieved an accuracy of 73% using the Oz channel, Jaccard similarity, and Natural Visibility Graph (NVG) while using the filtered data with 6-second windows and combined harmonics. Also, other occipital channels like O1 and O2 showed a good performance. Other cases like using non-occipital EEG channels and single harmonics did not show satisfactory results.

Conclusion : The VG approach shows considerable potential for improving SSVEP detection due to its simplicity and high accuracy. The VGSA method demonstrated over 50% accuracy even with shorter window lengths (2–2.5 seconds), suggesting that with further refinement, this technique could be effective in real-world BCI applications.

Keywords : Steady-State Visual Evoked Potential (SSVEP); Natural Visibility Graph (NVG); Horizontal Visibility Graph (HVG); Target Frequency Detection

Count: 396
Abstract ID: 481
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

In search of subcortical and cortical morphologic alterations of a normal brain through aging: an investigation by computed tomography scan

Submission Author: Mehrdad Ghorbanlou

Mehrdad Ghorbanlou[1], Fatemeh Moradi[2], Maasoume Abdollahi[3]

1. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran
2. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran
3. Department of Anatomical Sciences, Faculty of Medicine, AJA University of Medical Sciences, Tehran

Background and Aim : Morphologic changes in the brain through aging, as a physiologic process, may involve a wide range of variables including ventricular dilation, and sulcus widening. This study reports normal ranges of these changes as standard criteria.

Methods : Normal brain computed tomography scans of 400 patients (200 males, 200 females) in every decade of life (20 groups each containing 20 participants) were investigated for subcortical/cortical atrophy (bicaudate width [BCW], third ventricle width [ThVW], maximum length of lateral ventricle at cella media [MLCM], bicaudate index [BCI], third ventricle index [ThVI], and cella media index 3 [CMI3], interhemispheric sulcus width [IHSW], right hemisphere sulci diameter [RHSD], and left hemisphere sulci diameter [LHSD]), ventricular symmetry. Distribution and correlation of all the variables were demonstrated with age and a multiple linear regression model was reported for age prediction.

Results : Among the various parameters of subcortical atrophy, BCW, ThVW, MLCM, and the corresponding indices of BCI, ThVI, and CMI3 demonstrated a significant correlation with age ($R2 \geq 0.62$). All the cortical atrophy parameters including IHSW, RHSD, and LHSD demonstrated a significant correlation with age ($R2 \geq 0.63$).

Conclusion : This study is a thorough investigation of variables in a normal brain which can be affected by aging disclosing normal ranges of variables including major ventricular variables, derived ventricular indices, lateral ventricles asymmetry, cortical atrophy, in every decade of life introducing BW, ThVW, MLCM, BCI, ThVI, CMI3 as most significant ventricular parameters, and IHSW, RHSD, LHSD as significant cortical parameters associated with age.

Keywords : Brain, Multidetector computed tomography, Aging, Cerebral ventricles

Count: 397
Abstract ID: 483
subject: Computational Neuroscience: Computational Tools
Presentation Type: Poster

Targeting Positive Regulators of Sonic Hedgehog Signaling Pathway in Medulloblastoma by Designing CRISPR/Cas9 Single Guide RNAs

Submission Author: Mehrdad Ghorbanlou

Mehrdad Ghorbanlou[1], Mehdi mehdizadeh[2], Hassan Marzban[3]

1. Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran
2. Reproductive Sciences and Technology Research Center, Department of Anatomy, Iran University of Medical Sciences, Tehran, Iran
3. Children's Hospital Research Institute of Manitoba (CHRIM), College of Medicine, Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, Canada

Background and Aim : Medulloblastoma formation is importantly related to granular cell proliferation and differentiation, processes which are under the influence of sonic hedgehog (SHH) signaling. Exons of genes encoding different components of this signaling pathway (e.g., ligands, co-receptor, transcription factors, and target genes) were investigated to identify the proper single guide RNAs for selective targeting of positive regulators of the SHH pathway.

Methods : The genomic DNA sequences of corresponding genes of several positive regulators of the SHH pathway (in Homo Sapiens), including SHH, SMO, GLI1, GLI2, MYCN, and MYC, were retrieved from the National Center for Biotechnology Information (NCBI) gene database. Next, the exon sequences of these genes were identified using protospacer adjacent motif (PAM) of NGG and Streptococcus pyogenes Cas9 nuclease and evaluated by CRISPOR software to select the best sgRNA for each target gene.

Results : The analyses revealed the best sgRNAs for the SHH, SMO, GLI1, GLI2, MYCN, and MYC genes targeted exon 1, -4, -4, -5, -2 and -2, respectively. Proper sgRNAs for targeting each exon in each gene were also identified.

Conclusion : This study revealed possible specific exonic targets of components of the SHH signaling pathway through designing proper sgRNAs using the CRISPR/Cas9 genome editing approach.

Keywords : CRISPR/Cas9, Sonic Hedgehog, Medulloblastoma, Guide RNA, Genome

Count: 398
Abstract ID: 296
subject: Computational Neuroscience: Other
Presentation Type: Oral

Fuzzy Logic-Based Prediction Model for Endoscopic Third Ventriculostomy Outcomes in Children with Hydrocephalus

Submission Author: Shiva Ahmadi

Shiva Ahmadi[1], Reza Taheri[2]

1. Non Communicable Disease Research Center, FUMS
2. Children's Medical Center, TUMS

Background and Aim : The application of fuzzy logic in neurosurgery as a significant tool in enhancing decision-making processes where uncertainty and variability are prevalent has increased in the past few years. Applying fuzzy logic in clinical settings, especially in surgical planning, patient selection, and outcome prediction has been game-changing. By accommodating imprecise data and expert opinions, fuzzy logic systems facilitate the evaluation of complex clinical scenarios, enabling neurosurgeons to optimize interventions for conditions such as brain tumors, epilepsy, and traumatic injuries. Furthermore, combining fuzzy logic with AI and machine learning techniques promises to produce adaptive systems capable of real-time decision support. This approach improves the precision of surgical techniques and enhances patient safety and post-operative outcomes.

Methods : This study included patients under 18 years old with hydrocephalus who underwent ETV between March 2014 and May 2021. Data such as patient age, gender, history of previous shunt surgery, previous external ventricular drain placement, intraventricular hemorrhage history, and meningitis were extracted from medical records. Imaging features such as aqueductal stenosis, third ventricle floor bowing, displaced lamina terminalis, pulsatility index (PI), and maximum diameter of the cortical subarachnoid space (CSAS) were recorded for each patient using preoperative CT scans. Two independent neurosurgeons measured the CSAS maximum diameter and the PI. CSAS measurements were obtained on axial slices of the preoperative CT scans, whereas the PI was based on intraoperative third ventricle pulsatility. Patients were followed up for 1 year after surgery, with failure defined as the need for ventriculoperitoneal shunt (VPS) placement or death attributable to hydrocephalus. To incorporate imprecision and uncertainty in our data, we applied a fuzzification process as follows: 1. Define Fuzzy Sets: We determined linguistic labels (e.g., Low, Moderate, High) for the ETV success rate. Next, we created membership functions for each label. 2. Establish Range: We established ranges for each fuzzy set using membership functions. 3. Apply Membership Functions: We applied the defined membership functions for each crisp value in our dataset. 4. Calculate Membership Values: For each fuzzy set, we computed the degree of membership for the crisp input, ranging from 0 (not a member) to 1 (full member). 5. Fuzzification Process: For each crisp value, we assigned degrees of membership in the fuzzy sets based on the membership functions.

Results : This retrospective study analyzed preoperative data from pediatric hydrocephalus patients undergoing ETV. Fuzzification converted crisp values into fuzzy ones, accommodating uncertainty in data. By defining fuzzy sets and membership functions, researchers established variable ranges. Applying membership functions to input values calculated membership in each fuzzy set. Results suggest fuzzification benefits decision-making for ETV success probability, challenging traditional beliefs about the optimal age range.

Conclusion : In conclusion, this study demonstrates fuzzification's potential for improving decision-making in pediatric hydrocephalus ETV procedures. By incorporating imprecise data, fuzzy logic enables neurosurgeons to evaluate complex scenarios and optimize patient selection. This innovative approach transforms neurosurgical practices into more informed, flexible, and patient-centered methods. Further research can validate these findings and explore fuzzification's potential benefits.

Keywords : Fuzzy Logic; Hydrocephalus; ETV; Pediatric

Count: 399
Abstract ID: 300
subject: Computational Neuroscience: Other
Presentation Type: Poster

Extracting Neural Representations of Visual Input via Latent Space of a Conditional Variational Autoencoder

Submission Author: Fatemeh Mirzaei

Fatemeh Mirzaei[1], Zahra Bahmani[2]

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

Background and Aim : Neural coding is the brain's process of translating information into neural activity, while decoding involves interpreting this activity to recover information about the original stimuli. In vision, understanding how visual inputs are processed and represented in the brain is crucial. Our work focuses on decoding neural data to uncover valuable insights about the visual stimuli. By extracting features and capturing underlying sensory representations from neural signals, we aim to decode neural patterns that reflect specific visual stimuli. Additionally, we seek to reconstruct the neural data using these decoded features and representations. This reconstruction not only verifies the accuracy of the extracted features but also enhances our understanding of how the brain processes visual information.

Methods : In this study, we analyzed local field potential (LFP) signals recorded from the V4 area of macaques during a memory-guided saccade (MGS) task. These signals capture the collective electrical activity of neurons in response to visual stimuli, specifically during the visual period of the task. Our goal was to extract meaningful features from the LFP data to predict stimulus positions and generate synthetic LFP signals specific to those stimuli. We employed a conditional variational autoencoder (CVAE) to model and reconstruct the LFP signals. The CVAE allowed us to reduce the original 512-dimensional LFP data into a 5-dimensional latent space, effectively compressing the data while retaining critical features and underlying representations. This latent representation was then used to decode stimulus positions and generate realistic synthetic LFP signals corresponding to visual stimuli. A key aspect of our approach is the use of a specialized loss function designed to maximize the weight of a specific frequency band, ensuring that both high- and low-frequency components are effectively captured in the reconstructed signals.

Results : Our experimental results demonstrate that the latent space representations produced by the CVAE can classify two distinct stimulus positions with an accuracy of 82.89%. The dimensionality reduction from 512 to 5 did not compromise the critical features of the signals, as shown by the model's ability to retain essential information for both classification and reconstruction. Moreover, the reconstruction of LFP signals yielded a mean squared error of 0.2005, indicating that the generative capabilities of the CVAE produced accurate synthetic

LFP data. This highlights the model's effectiveness in capturing underlying representations while maintaining signal integrity.

Conclusion : This study demonstrates the effective use of a CVAE to reduce 512-dimensional LFP data recorded during the visual period of the MGS task into a 5-dimensional latent space while preserving key features. Notably, to the best of our knowledge, we are the first to apply deep learning methods for feature extraction and to reconstruct LFP signals. Our approach enabled accurate classification of stimulus positions and facilitated the decoding of neural data, providing valuable insights into the underlying neural representations. Additionally, the model's generative capabilities allow for data augmentation, creating realistic LFP signals that enhance training datasets. By offering a deeper understanding of neural representation of the visual stimuli, this work opens new avenues for research in neuroscience and neural signal processing.

Keywords : Neural Decoding; Conditional Variational Autoencoder; Local Field Potentials; Feature Extraction; Signal Reconstruction

Count: 400
Abstract ID: 574
subject: Neurorehabilitation and Regeneration: Physiotherapy
Presentation Type: Poster

The effect of deep brain stimulation in the treatment of neurological diseases

Submission Author: Somaye Hesami

Somaye Hesami[1], Elham Zare[2], Seyed Sajjad Alavi Kakhki[3]

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

Conclusion : Introduction: Deep brain stimulation (DBS) has emerged as a transformative neuromodulation technique for the treatment of various neurological diseases, particularly movement disorders such as Parkinson's disease, essential tremor, and dystonia. DBS involves the implantation of electrodes within specific brain regions, delivering targeted electrical stimulation that modulates aberrant neuronal activity. This review examines the current state of research on DBS, focusing on its mechanisms of action, therapeutic benefits, and challenges in the management of neurological disorders. Materials and Methods: A comprehensive literature review was performed using electronic databases including PubMed, Scopus, and Web of Science, targeting studies published between 2000 and 2023. The search strategy included keywords such as "deep brain stimulation," "neurological diseases," "Parkinson's disease," "essential tremor," "dystonia," and "clinical outcomes." A total of 70 peer-reviewed articles, including randomized controlled trials, observational studies, and meta-analyses, were included to evaluate the efficacy and safety of DBS across various neurological conditions. Results: DBS has demonstrated substantial benefits in managing motor symptoms, particularly in Parkinson's disease, where it can significantly reduce tremor, rigidity, and bradykinesia. Recent studies indicate that DBS can also improve quality of life and cognitive function in select patients. For essential tremor and dystonia, DBS has shown comparable efficacy, leading to marked symptom relief and improved daily functioning. Despite its benefits, some patients experience adverse effects, such as speech disturbances, mood alterations, and infection risks associated with the surgical procedure. Discussion: The therapeutic effects of DBS are believed to result from the modulation of abnormal neural circuits implicated in movement disorders. While the precise mechanisms remain under investigation, the ability of DBS to provide real-time modulation of neuronal activity offers unique advantages over traditional pharmacological approaches. Limitations of DBS include variability in patient response, the need for individualized programming, and complications arising from the surgical implantation process. Moreover, ongoing studies are exploring the potential use of DBS in other neurological disorders, such as depression, obsessive-compulsive disorder, and epilepsy, indicating a broadening scope of this therapeutic modality. Conclusion: Deep brain stimulation is a valuable treatment option for several neurological diseases, particularly in patients who are unresponsive to conventional therapies. Although DBS presents significant benefits in improving motor function and quality of life, careful patient selection, rigorous monitoring,

and comprehensive multidisciplinary care are essential for optimizing outcomes. Continued research into the mechanisms of action, long-term effects, and applications of DBS will further enhance its utility in the management of neurological disorders and expand its potential to address a wider range of conditions.

Keywords : Deep brain stimulation, neurological diseases, Parkinson's disease, essential tremor, dystonia, and clinical outcomes.

Count: 401
Abstract ID: 619
subject: Neurorehabilitation and Regeneration: Speech and Language Therapy
Presentation Type: Poster

Non-Invasive Brain Stimulation for Stuttering: A Review

Submission Author: Fateme Khari

Fateme Khari[1], Dr. Seyed Abolfazl Tohidast[2], Rozita Hedayati[3]

1. Student Research Committee, Semnan University of Medical Sciences, Semnan, Iran
2. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran
3. Associate professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Sciences, Semnan, Iran

Conclusion : Introduction: This narrative review explores the current applications and future directions of non-invasive brain stimulation (NIBS) techniques in treating stuttering. We discuss the efficacy, mechanisms, and challenges associated with these interventions, highlighting the potential for NIBS to complement traditional speech therapy. Methods: A comprehensive search was conducted across multiple databases, including PubMed and Google Scholar, focusing on studies published from 2000 to 2024. The search terms included “non-invasive brain stimulation,” “Transcranial magnetic stimulation,” “Transcranial direct current stimulation,” and “stuttering.” Only peer-reviewed articles, clinical trials, and meta-analyses were included. Studies were selected based on their relevance to the topic, methodological rigor, and clarity of outcomes. Data were extracted regarding participant demographics, stimulation parameters, outcome measures, and reported efficacy. Studies were synthesized qualitatively to identify common findings and themes. Results: The review identified 15 key studies investigating the use of NIBS in stuttering treatment. The majority of the studies focused on tDCS and TMS, targeting areas such as the left supplementary motor area (SMA) and the dorsolateral prefrontal cortex (DLPFC). Results consistently showed that NIBS could reduce stuttering frequency and improve speech fluency. For instance, anodal tDCS applied to the SMA led to significant fluency improvements in 60% of participants. TMS studies reported similar efficacy, with repetitive TMS (rTMS) sessions enhancing speech fluency in a comparable proportion of subjects. Functional imaging data indicated that these improvements were associated with increased neural activity and connectivity in speech-related regions. Despite these promising results, variability in stimulation parameters and individual responses highlighted the need for further research to optimize treatment protocols. Conclusion: NIBS techniques show promise as a complementary treatment for stuttering, with potential to enhance speech fluency and improve quality of life for individuals who stutter. Further research is needed to refine these techniques and establish standardized guidelines.

Keywords : Stuttering ; Brain Stimulation ; Speech therapy

Count: 402
Abstract ID: 339
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Protective Effects of Hypoxia-Preconditioned Hair Follicle Stem Cell Secretome on Astrocytes Under Oxygen-Glucose Deprivation

Submission Author: Mohammad Ghasemian

Mohammad Ghasemian[1], Zahra Jamali[2], Mehdi Dianatpour[3], Mohammad Saied Salehi[4], Sareh Pandamooz[5]

1. Department of Medical Genetics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Medical Genetics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
3. Stem Cells Technology, Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
4. Clinical Neurology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
5. Stem Cells Technology, Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background and Aim : Stroke is a leading cause of death and disability worldwide, caused by ischemic damage from interrupted blood flow. Stem cell-derived secretomes, rich in bioactive factors that promote tissue repair, are enhanced by hypoxic preconditioning, which increases the production of neurotrophic and angiogenic factors, offering a promising therapeutic strategy. Therefore, this in-vitro study investigates the effects of hypoxia preconditioned secretome from hair follicle stem cells (HFSCs) on astrocytes under stroke-like conditions.
Methods : HFSCs were isolated from the bulge region of rat hair follicles and cultured for 24h under both normoxic (HFSC-normoxia) and hypoxic (HFSC- hypoxia) conditions to stimulate preconditioning. One the other hand, Astrocytes, purified from neonatal rat cortices, were subjected to oxygen-glucose-serum deprivation (OGSD), mimicking ischemic stroke conditions. The HFSC-derived secretomes were then applied to these astrocytes to assess their neuroprotective effects. The groups were analyzed for cell apoptosis (Annexin V-FITC/PI), cell viability (MTT) and gene expression (qPCR) of key neurotrophic factors.
Results : The results revealed that gene expression analysis of astrocytes cultured under OGSD conditions showed increased levels of BDNF, and HIF-1α, but no changes in VEGF in the CM-hypoxia group. Notably, the CM-hypoxia group demonstrated a significant reduction in the inflammatory factors IL-1β and TNF-α. According to flowcytometry, both early and late apoptosis were reduced in the hypoxia-preconditioned group compared to the normoxic group.
Conclusion : In conclusion, hypoxia-preconditioned HFSC-derived secretomes demonstrate enhanced neuroprotective properties, promoting astrocyte survival under ischemic-like conditions. These findings suggest that such secretomes hold potential for developing new therapeutic strategies for stroke recovery. Further studies are needed to confirm these effects in vivo and explore their clinical applications.
Keywords : Stroke, Hair follicle stem cells (HFSCs), Hypoxic preconditioning, Secretome, Neurotrophic factors

Count: 403
Abstract ID: 492
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

BDNF Expression Modulation by Neural Stem Cells in Preclinical Models of Spinal Cord Injury, a systematic review

Submission Author: Mohammad Ebrahim Abbaszadeh Kahnamooyi

Mohammad Ebrahim Abbaszadeh Kahnamooyi[1], Mahdi Esmaeili[2], Ali Golchin[3]

1. Student Research Committee, Urmia University of Medical Sciences, Urmia, IRAN
2. Department of Anatomy, Faculty of medicine, Tabriz University of Medical Sciences, IRAN
3. Department of Applied Cell Sciences, Medical School, Urmia University of Medical Sciences, Urmia, IRAN

Conclusion : Introduction: Spinal cord injury (SCI) is a severe neurological injury that leads to permanent motor and sensory deficits. After SCI, inflammatory responses and neuronal cell destruction limit regeneration and recovery. Brain-derived neurotrophic factor (BDNF) plays a key role in protecting neurons, enhancing neural plasticity, and promoting spinal cord repair. Increased BDNF expression can accelerate recovery following injury. Neural stem cells (NSCs), due to their ability to differentiate into neurons and produce protective factors like BDNF, have emerged as a promising therapeutic option for SCI. This study aims to evaluate the effects of NSCs on BDNF expression in preclinical SCI models to accurately assess the efficacy of these cells in neural repair. Methods: A literature search was conducted in PubMed, Scopus, and Web of Science databases until June 2023, following PRISMA guidelines. Keywords included Spinal cord injury, BDNF, and Neural stem cells. Inclusion criteria were preclinical studies on animal models of SCI that examined the effects of stem cells on BDNF expression. Review articles, letters, and studies not evaluating BDNF expression were excluded. Data were extracted by two researchers, including details such as injury models, stem cell types, and changes in BDNF expression. The quality of studies was assessed using the CAMARADES checklist. Results: After searching for articles based on Mesh terms and reviewing the obtained studies, a total of 11 studies met the inclusion criteria. These studies used various rat models to induce spinal cord injury. Among them, one study induced injury in the cervical region, while the others induced injuries in the thoracic segments. Neural stem cells (NSCs) were administered at varying doses. In 9 studies, a significant increase in BDNF expression was observed following NSC injection compared to the injured group. However, in 2 studies, this increase in BDNF expression after NSC injection was not observed. Conclusion: The results of this review indicate that NSC transplantation generally leads to increased BDNF expression in preclinical SCI models, positively impacting neural repair and functional recovery. However, the variability in some studies suggests that factors such as NSC type, timing of administration, and delivery methods may influence BDNF expression. While NSCs show potential for SCI treatment, further research is necessary to better understand how different variables affect BDNF expression and recovery outcomes.

Keywords : Spinal cord injury; Brain Derived Neurotrophic Factors; Neural Stem Cells

Count: 404
Abstract ID: 68
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

Neuroprotective effect of human cord blood-derived extracellular vesicles by improved neuromuscular function and reduced gliosis in a rat model of Huntington's disease

Submission Author: Reza Bahar

Reza Bahar[1], Hojjat-Allah Abbaszadeh [2], Abbas Aliaghaei[3]

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

Background and Aim : Huntington's disease (HD) is a hereditary condition characterized by the gradual deterioration of nerve cells in the striatum. Recent scientific investigations have revealed the promising potential of Extracellular vesicles (EVs) as a therapy to mitigate inflammation and enhance motor function. This study aimed to examine the impact of administering EVs derived from human umbilical cord blood (HUCB) on the motor abilities and inflammation levels in a rat model of HD.

Methods : After ultracentrifugation to prepare EVs from HUCB to determine the nature of the obtained contents, the expression of CD markers 81 and 9, the average size and also the morphology of its particles were investigated by DLS and Transmission electron microscopy (TEM). Then, in order to induce the HD model, 3-nitropropionic acid (3-NP) neurotoxin was injected intraperitoneal into the rats, after treatment by HUCB-EVs, rotarod, electromyogram (EMG) and the open field tests were performed on the rats. Finally, after rat sacrifice and the striatum was removed, Hematoxylin and eosin staining (H&E), stereology, immunohistochemistry, antioxidant tests, and western blot were performed.

Results : Our results showed that the contents of the HUCB-EVs express the CD9 and CD81 markers and have spherical shapes. In addition, the injection of HUCB-EVs improved motor and neuromuscular function, reduced gliosis, increased antioxidant activity and inflammatory factor, and partially prevented the decrease of neurons.

Conclusion : The findings generally show that HUCB-EVs have neuroprotective effects and reduce neuroinflammation from the toxic effects of 3-NP, which can be beneficial for the recovery of HD.

Keywords : Neuroprotection; 3-NP; Huntington's disease; Extracellular Vesicles; Striatum; Umbilical Cord Blood

Count: 405
Abstract ID: 241
subject: Neurorehabilitation and Regeneration: Medication and Stem Cell Therapy
Presentation Type: Poster

From damage to recovery: the potential of stem cells in the treatment of spinal cord injury

Submission Author: Mina Abbasi

Mina Abbasi[1]

1. student research committee, school of medicine, Mashhad university of medical science, Mashhad, Iran

Conclusion : Spinal cord injury (SCI) is a condition affecting the central nervous system and results in various neurological sequelae in the motor, sensory, and autonomic systems, which can dramatically reduce the quality of life in patients with SCI. Spinal cord injury has become a worldwide health priority due to its excessive rates of disability and its high global burden. There is still a lack of effective treatments for it because of the limited regenerative potential of the central nervous system to restore cells, myelin, and neural connections, axon regeneration failure, and time-sensitive pathophysiology tissue, make recovery from an SCI challenging. Despite numerous medical advancements there are presently no effective regenerative medicine. None of the traditional treatments specifically include surgical decompression and pharmacotherapy, which could attenuate or even alleviate long-term complications following SCI. Stem cell based regenerative therapy has opened a pathway for practical healing of patients with SCI. For more than two decades, stem cell based regenerative therapy has been investigated as a cutting-edge remedy that is expected to change the prognosis after SCI. Although many therapeutic methods have been attempted to deal with SCI, cellular transplantation offers the greatest promise in reconstituting the structure of the damaged cord. Stem cell therapy is an emerging treatment for SCI and has demonstrated neuroprotective and pro-regenerative abilities. Cell therapy, especially with mesenchymal stem cell derived exosomes (MSC-exosomes) may hold the key to exciting new treatment options for SCI patients. The potential mechanisms of stem cell therapy consist of tissue repair and replacement, neurotrophy, regeneration and the promotion of angiogenesis, anti-apoptotic and anti-inflammatory. Stem cell therapy for SCI can prevent immune rejection and induce the release of neuroprotective and anti-inflammatory factors to decrease the production of stress-related proteins, reactive oxygen species and inflammatory reactions. While there’s hope, there is currently no firm evidence that stem cell therapy can cure SCI. Stem cell therapy is a promising area of research for the treatment of SCI. This review aims to provide a summary of SCI stem cell therapy, including the effects, strategies, efficacy, and available therapies.

Keywords : spinal cord injury ; stem cell ; regenerative medicine

Count: 406
Abstract ID: 207
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

Efficacy of Transcranial Direct Current Stimulation (tDCS) in Addressing Hemolacria and Hypertension with Mood-Emotional Disorders and Insomnia: A Case Report

Submission Author: ROGHAYEH MOHAMMADIGAREGOZLU

ROGHAYEH MOHAMMADIGAREGOZLU[1], Ahmad Alipoor [2]

1. 1. Postdoc in Clinical Neuropsychology
2. 2. Professor, Department of Psychology, Payam Noor University, Tehran, Iran

Background and Aim : Overview and Aim: Hemolacria, as a rare condition which refers to the presence of blood in tears is most often a benign and self–limited process. However, it can be linked to severe systemic as well as ocular conditions, which means it should be evaluated properly. Patients presenting with hemalacri may require comprehensive ophthalmic and systemic examinations. If no ocular or systemic cause is identified, psychiatric disorders should be explored. In view of the presence of multiple psychiatric disorders in this case, the efficacy of transcranial direct current stimulation (tDCS) for the treatment of hemalacri was explored in this case.

Methods : Case Presentation: The patient, a 49-year-old woman, experienced a car accident 17 years ago, followed by a coma, eight years of hematemesis, and a one-and-a-half-month period of vision loss in the left eye. She also had treatment refractory depression, anxiety, insomnia, and hypertension. Hemolacria gradually developed over several years.

Results : A course of tDCS targeting the left dorsolateral prefrontal cortex (DLPFC) (F3, FP2) alleviated the patient's depression, anxiety, sleep disturbances, and hypertension. Consequently, the frequency and severity of hemalacri episodes significantly decreased from four to five times daily to once every one to two months with a much smaller volume.

Conclusion : This case report highlights the importance of considering both psychological and physiological stressors that may trigger hemalacri and advocates for a multimodal treatment approach encompassing medical, psychological-neuropsychological interventions.

Keywords : Hemolacria, Depression, Anxiety, Insomnia, Brain Electrical Stimulation

Count: 407
Abstract ID: 402
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

Investigating the immunogenicity of vaccines based on bacterial Lipopolysaccharide (LPS) in Iran: A systematic review

Submission Author: Mobina Tahmasebizadeh

Mobina Tahmasebizadeh [1], Zahra Akrami[2], Mohammad Esmaeil Amini [3]

1. Students Research Committee, Faculty of Paramedical Sciences, Ardabil University of Medical Sciences, Ardabil, Iran
2. Students Research Committee, Faculty of Paramedical Sciences, Ardabil University of Medical Sciences, Ardabil, Iran
3. Department of Microbiology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Conclusion : Introduction: Lipopolysaccharide (LPS) is a part of the structure of gram-negative bacteria and therefore it is specific to gram-negative bacteria. The most important feature of LPSs is the immunogenicity of these molecules. By stimulating the immune system, LPSs cause the release of pro-inflammatory cytokines, which if we want to use this property of LPSs positively, we can treat them with monoclonal antibodies for a specific infectious area (especially viral infections and cancers). On the other hand, due to the immunogenicity of LPSs, they have been candidates for vaccine design against the bacteria that produce them. Search strategy : A systematic search was prepared and reported through searching the Web of Science, PubMed, Scopus, Embase, and Google Scholar electronic databases to find all available articles that are pertinent to our design from January 2010 to December 2018. Afterward, 11 publications meeting the inclusion criteria were included for data extraction and analysis. Results : Among the conducted studies, 5 cases of using LPS in vaccine preparation were related to Brucella abortus LPS. 2 studies were related to LPS of Vibrio cholera and LPS of Salmonella typhimurium, Pseudomonas aeruginosa, Escherichia coli and Legionella pneumophila had one study each. Due to their molecular structure and low immunogenicity, LPSs are usually used in the preparation of vaccines in the form of conjugates or adjuvants, which in most studies are conjugated with toxins from other bacteria, including 3 studies of Diphtheria toxin and 1 study of Tetanus toxin. They can also be used conjugated to surface protein structures of other bacteria, which are potent immunogens. Among these protein structures, cagA protein of Helicobacter pylori, tuberculin of Mycobacterium tuberculosis, serum albumin or other peptides can be used. Also, nanoparticles are sometimes used as LPS conjugates. Conclusion: The Toxicity is different from immunogenicity. During the product preparation process, we reduce the toxicity of LPS, but by linking it to another antigen, which is generally either a protein antigen or a high molecular weight nanoparticle, its immunogenicity increases. According to the research conducted in Iran on LPS-based vaccines, they all came to the conclusion that LPS after reducing toxicity and linking with another antigen had good immunogenicity compared to LPS alone, so LPS They can be good candidates for vaccination against bacteria.

Keywords : Lipopolysaccharide, Vaccine, Immunogenicity , Conjugate

Count: 408
Abstract ID: 634
subject: Neurorehabilitation and Regeneration: Other
Presentation Type: Poster

Model Predictive Control in Diagnosis and Disability Prediction in brain stroke

Submission Author: Hossein Hassanzadeh Yaghini

Hossein Hassanzadeh Yaghini[1], Fezzeh Hosseinzadeh[2]

1. Faculty of Electrical and Computer Engineering, University of Tabriz, Tabriz, Iran
2. Department of Physiology, Sarab Faculty of Medical Sciences, Sarab, Iran

Background and Aim : Model Predictive Control (MPC) is becoming increasingly important for diagnosing and predicting disabilities caused by brain strokes.

Methods : -

Results : This review discusses how MPC is being used in this context. MPC can develop dynamic models of a patient's health status by incorporating real-time data from different sources such as imaging and vital signs. This allows for continuous assessment and timely intervention, crucial for managing strokes. MPC frameworks can optimize rehabilitation protocols by adjusting treatment plans based on predicted recovery paths. This is especially beneficial for customizing therapies for individual patients and improving their recovery outcomes after a stroke. By utilizing patient-specific data, MPC can help forecast long-term disability outcomes, enabling healthcare providers to make well-informed care plans and resource allocation decisions. Integrating MPC with machine learning techniques can further enhance predictions. For instance, machine learning algorithms can analyze historical patient data to improve the accuracy of MPC models in predicting stroke outcomes.

Conclusion : As a result, MPC can be considered an effective method for Diagnosis and Disability Prediction of brain stroke. Ongoing research in these areas suggests that integrating MPC into the stroke management framework has the potential to improve diagnosis accuracy and enhance patient care.

Keywords : brain stroke, Diagnosis and Model Predictive Control

Count: 409
Abstract ID: 664
subject: Neurorehabilitation and Regeneration: Cognitive Rehabilitation
Presentation Type: Poster

Revolutionizing Human-Computer Interaction: Exploring the Potential of Brain-Computer Interfaces in Patients with Neurological Disorders

Submission Author: Parizad Najafi

Parizad Najafi[1], Shahrzad Najafi[2], Sajjad Mollaei[3], Sahar Ghorbanikalateh [4], Sahel Ghorbanikalateh [5], Sara Youssefian[6], Ali Yazdiani[7], Gol Ara Hadi Nasab [8], Sajad Sahab-Negah[9]

1. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Mashhad University of Medical Sciences, Department of Physiology, Mashhad, Iran.
4. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
5. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
6. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
7. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
8. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
9. 1. Neuroscience Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. 2.Department of Neuroscience, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Conclusion : Abstract Introduction: Neurological disorders such as stroke, Amyotrophic Lateral Sclerosis (ALS), and Spinal Cord Injury (SCI) have increasingly affected populations worldwide, resulting in significant disability and diminished quality of life. Traditional rehabilitation therapies often provide limited long-term benefits, highlighting the need for innovative solutions. The aim of this systematic review is to evaluate the impact of Brain-Computer Interfaces (BCIs) on motor and communication recovery in patients with neurological disorders, compare their effectiveness with traditional therapeutic approaches, and explore the future potential of BCIs as a novel treatment strategy. Methods: This systematic review and meta-analysis adhered to PRISMA-P guidelines and the PICO framework. Searches in PubMed, Web of Science, Scopus, and Embase identified 556 records, with 44 studies included. These studies comprised randomized controlled trials (RCTs) and clinical trials assessing various BCI interventions, including electroencephalography (EEG), motor imagery (MI), functional electrical stimulation (FES), and robotic devices. Data were analyzed to compare the effectiveness of BCIs with conventional therapies. Results: The findings indicate that BCIs, particularly those incorporating EEG and MI, provide superior outcomes compared

to traditional therapies in enhancing motor and communication functions. BCIs, especially when combined with standard rehabilitation methods, demonstrate significant improvements in patients with stroke, ALS, and SCI. EEG-based BCIs were particularly effective in improving motor function and gait. Discussion: Our study highlights that BCIs can offer a significant advancement in neurorehabilitation, delivering better outcomes compared to conventional treatments. This technology has the potential to overcome the limitations of traditional therapies and provide new opportunities for patients with severe disabilities. Based on these positive findings, the aim for future research should be to optimize BCI technology and integrate it with existing treatments to maximize patient benefits and improve therapeutic outcomes.

Keywords : Brain-Computer Interfaces; Neurological Disorders; Motor Recovery; Communication Recovery; Neurorehabilitation; EEG

Count: 410
Abstract ID: 559
subject: Social Neuroscience: Developmental approaches
Presentation Type: Oral

MOHAK: A community-based study focused on enhancing communication and reducing chronic stress in Iran.

Submission Author: Mahdi Khodadoust

Mahdi Khodadoust[1], Nozar Nakhaee[2], Reyhane Mohamadi[3], Gholamreza Asadi-Karam[4]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran.
2. Health Services Management Research Center, Institute of Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran
3. 2. Rehabilitation Research Center, Department of Speech Therapy, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran
4. Applied Cellular and Molecular Research Center, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim : This study is based on various previous studies related to child development. It uses the well-known nurturing care framework to create a community-based intervention protocol to enhance child care, particularly focusing on language development. The intervention protocol is designed to be simple and applicable to a wider population, with consideration for cost-effectiveness and ease of implementation within the existing health network infrastructure in Iran.

Methods : The present study is a quasi-experimental research. A total of 302 families participated, with 167 families from Kerman City in the intervention group and 135 families from Bardsir City in the control group. The intervention group received a designed intervention protocol, which included the comprehensive care application for children (MOHAK) and virtual question-and-answer groups. The MOHAK application contains text, audio, and short video clips focused on "nurturing care." In addition, mothers can ask their questions to various experts, including midwives, nutritionists, psychologists, speech and language pathologists, general practitioners, gynecologists, and pediatricians, through the communication section with MOHAK experts and also the WhatsApp group. All mothers were evaluated for stress and depression, child care indicators, level of family and spouse support, and mother-fetus/child attachment at the beginning of the project, after delivery, and at 4, 12, and 18 months of age. Starting from the child's 4 months onwards, the child's language and communication development and chronic stress were also assessed. Chronic stress of the child was measured by analyzing hair cortisol levels in the laboratory. This research is one of the first cases that used this measurement in Iran.

Results : Out of 398 invited participants, 302 entered the study. There were no significant differences between the groups in terms of mother's and father's age, mother's education, number of children, number of years since marriage, and type of pregnancy (planned or accidental) (P value > 0.5). However, there were differences between groups in paternal

education and the week of entering the study (P value ? 0.01). The research results indicated that the intervention significantly improved language and communication development (P value=0.008), family care indicators (P value=0.01), husband support (P value=0.001), and family support (P value=0.013) compared to the control group. Furthermore, strengthening the mother-child relationship led to a notable reduction in chronic child stress (P value=0.026) in the intervention group compared to the control group. No significant differences were observed between the two groups in terms of maternal stress, depression, and mother-fetus/child attachment (P value > 0.5).

Conclusion : This study confirmed the efficacy of the intervention protocol, which included the use of the MOHAK application and virtual Q&A groups, in enhancing language and communication development, reducing chronic child stress, and improving family care indicators. These findings can be valuable for designing studies involving larger populations.

Keywords : Child, Mother, Cortisol, Child care, Language development, Mobile application

Count: 411
Abstract ID: 238
subject: Social Neuroscience: Interpersonal processes
Presentation Type: Poster

Gender Differences in Moral Decision-Making: A Behavioral Study

Submission Author: Mohsen Ghorbani

Mohsen Ghorbani[1], Negin Safarzadeh Nobarian[2], Soroush Fazel[3], Ali Jahan[4], Farhad Farkhondeh Tale Navi[5], Soomaayeh Heysieattalab[6]

1. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
2. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
3. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
4. Department of Speech therapy, Tabriz University of Medical Sciences, Tabriz, Iran
5. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran
6. Department of Cognitive Neuroscience, University of Tabriz, Tabriz, Iran

Background and Aim : Moral decision-making involves the interplay of cognitive and emotional processes. According to Dual Process Theory, personal moral dilemmas evoke fast, emotionally driven decisions, while impersonal dilemmas require more cognitive processing, resulting in slower responses. This study examined reaction times (RTs) and utilitarian decision patterns across personal, impersonal, and neutral scenarios, adding a focus on gender differences. Prior research has found that personal dilemmas result in quicker responses and fewer utilitarian decisions, while neutral dilemmas lead to slower, and more deliberative responses.

Methods : Fifty-six participants completed a moral decision-making task involving personal, impersonal, and neutral scenarios. Reaction times were recorded, and decisions were categorized as either utilitarian or deontological. A one-way ANOVA was used to analyze RTs across scenarios. Gender differences were assessed with a two-way ANOVA, enabling comparison of RTs and decision patterns across both scenario types and gender groups.

Results : The average total RT was 4011 ms. Participants responded fastest to personal scenarios (M = 3785 ms), followed by impersonal scenarios (M = 3873 ms), and slowest to neutral scenarios (M = 4374 ms). A one-way ANOVA showed significant differences between personal and neutral ($p < 0.0001$) and impersonal and neutral scenarios ($p < 0.0001$), but no significant difference between personal and impersonal scenarios ($p = 0.41$). Gender differences revealed that women had slower overall RTs (M = 4125 ms) than men (M = 3904 ms). While no significant gender difference was found in personal scenarios ($p = 0.0759$), women showed significantly slower RTs in impersonal ($p = 0.007$) and neutral scenarios ($p = 0.02$). Utilitarian decisions were more frequent in impersonal and neutral scenarios than in personal ones. The percentage of utilitarian decisions differed significantly between personal and impersonal ($p = 0.001$) and personal and neutral scenarios ($p < 0.0001$) Gender analysis showed no significant difference in utilitarian responses between men and women in personal or impersonal scenarios. However, a significant difference emerged in neutral scenarios ($p = 0.01$), with women making more utilitarian decisions.

Conclusion : This study supports Dual Process Theory, as personal moral dilemmas elicited faster, emotion-driven responses, while impersonal and neutral scenarios required more cognitive deliberation, leading to slower RTs and more utilitarian decisions. Gender differences indicated that women generally took longer to respond, especially in impersonal and neutral scenarios, and made more utilitarian decisions in neutral situations. These findings align with Greene et al. (2004) but differ from studies like Bartels & Pizarro (2011), which found fewer gender-based differences. Further research could explore electrophysiological methods such as ERP to deepen understanding of the cognitive processes underlying moral judgment.

Keywords : Moral Decision-Making; Gender Differences; Reaction Times; Utilitarian Decisions; Dual Process Theory; Emotional Processing

Count: 412
Abstract ID: 267
subject: Social Neuroscience: Gamification
Presentation Type: Poster

Gamification Strategies for Preventing Attention Deficit Hyperactivity Disorder Symptoms in Children: A Narrative Review

Submission Author: Sayed Mehrdad Azimi

Sayed Mehrdad Azimi [1], Mohammadamin Paymard[2], Mohammad Ali Mirsafi Niasar[3], Fateme Keshtparvar[4], Hossein Salehi[5]

1. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
2. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
3. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
4. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
5. Department of Anatomical Sciences, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Conclusion : -This review suggests gamification holds significant promise as a non-pharmacological tool for ADHD prevention in childhood. The integration of game elements into preventive strategies appears to enhance motivation, engagement, and cognitive skills crucial for ADHD management. Gamification's adaptability allows for tailored interventions addressing various aspects of ADHD symptomatology. However, challenges remain, including the need for rigorous, long-term studies and standardized assessment methods. Future research should focus on optimizing techniques for different age groups, exploring personalized interventions, and investigating underlying neurobiological mechanisms. As the field evolves, gamification may offer an engaging approach to ADHD prevention, potentially transforming early intervention strategies. While promising, it's crucial to approach gamification as a complementary tool within a comprehensive prevention strategy, rather than a standalone solution.

Keywords : Attention Deficit Disorder with Hyperactivity, Gamification, Cognitive Remediation, Child

Count: 413
Abstract ID: 292
subject: Social Neuroscience: Gamification
Presentation Type: Poster

To Consensus or Not to Consensus: Exploring the Complex Interplay of Group Size, Decision Rules, and Uncertainty in Collective Decisions

Submission Author: Atena Gholami

Atena Gholami[1], Atiye Sarabi-Jamab[2], Narges Sotoodeh[3]

1. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran
2. Faculty of Governance, University of Tehran, Tehran, Iran
3. Department of Cognitive Psychology, Institute for Cognitive Science Studies (ICSS), Tehran, Iran

Background and Aim : Decision-making is a fundamental human cognitive process that significantly shapes our daily lives. Given that a significant part of an individual's daily life involves interactions within different groups such as family, friends, colleagues, etc., it is essential to understand the impact of these social contexts on higher cognitive processes like decision-making. This study explored the influence of group decision rules (majority and unanimity) and group size (small and large) on people's known and unknown risk (ambiguity) attitudes in individual and group settings.

Methods : 112 individuals aged 18 to 45 from Tehran were randomly selected to participate. Behavioral data were collected from participants through an economic computer game conducted in individual and group stages. The task was designed with four treatments of majority-small (MS), unanimity-small (US), majority-large (ML), and unanimity-large (UL), and each subject was impartially and randomly assigned to one. The game consisted of 2 blocks of known risk and unknown risk trials.

Results : Results indicate that individuals in group settings exhibited significantly more risk-neutral preferences compared to individual settings under known risk conditions. The unanimity decision rule was associated with greater risk neutrality under known risk, while group size had no significant effect. For unknown risk (ambiguity), the unanimity rule resulted in more ambiguity aversion than the majority rule. Additionally, group decisions made in small groups were more ambiguity-averse than those in large groups. Finally, varying levels of unknown risk influenced ambiguity attitudes in both individual and group settings.

Conclusion : This study explored the impacts of decision rules (majority vs. unanimity) and group size (small vs. large) on the change of individuals' and groups' attitudes toward known and unknown risks (ambiguity). Our findings suggest that group settings can lead to more moderate decisions than individuals, a trend observed in both known and unknown risk scenarios. This implies that groups can mitigate individual decision preferences, particularly in uncertain situations, guiding them towards a more neutral stance. This might be explained by the fact that when people are placed in a group, they may experience some level of responsibility toward their contribution in reaching a group decision. Therefore, they prefer

safer decisions than when the decision outcome is just affecting themselves. In addition, people may feel their teammates are judging them, so they choose to behave moderately and avoid violating group norms. The results reveal that group decision rules and size account for changes in people's known risk preferences, implying that people's attitudes toward known risk are impacted by placing them in small or large groups under majority or unanimity decision rules. our results showed that groups employing the majority rule exhibited a greater tendency towards known risk neutrality than the unanimity rule, implying that reaching a consensus-based group decision can lead to less risk aversion. This can be interpreted by group polarization, in which group decisions shift toward a more extreme stance than individually. Interestingly, we observed that in unanimity group decisions, people exhibited more ambiguity-averse preferences than in majority groups, suggesting that people may feel significant doubt or fear about their decision outcome under ambiguity.

Keywords : group decision-making; collective decisions; decision rules; unanimity; majority; group size; uncertainty; known and unknown risk attitude; ambiguity attitude

Count: 414
Abstract ID: 223
subject: Social Neuroscience: Other
Presentation Type: Poster

The effect of Magic Mushroom (Psilocybe Azurescens) on the expression of neurotrophic and inflammatory factors in male Wistar rats

Submission Author: Elham Ghadyani

Elham Ghadyani[1], Parisa Akbari[2], Elmira Beirami[3], Neda Valian[4], Samaneh Nabavi Fard[5]

1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, 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
5. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Magic mushroom contains psilocybin and is known as psychedelic mushroom. Nowadays the consumption of this mushroom by young people, especially at a young age, has increased a lot. The aim of study was to investigate the effect of long-term use of magic mushroom on the expression of neurotrophic and inflammatory factors in male Wistar rats

Methods : Rats were divided into 4groups: control (treatment with saline), doses of10,100 and 250mg/kg of magic mushroom. Rats received different doses of mushroom for 2weeks (every other day) by gavage. According to the results of memory and learning tests, the dose of 250mg/kg of mushroom was selected for molecular evaluations. The expression levels of BDNF and GDNF as neurotrophic factors and TNFα as an inflammatory factor in the hippocampus and prefrontal cortex of rats receiving a dose of 250 mg/kg of mushroom were measured by ELISA

Results : Results showed a significant decrease in the level of BDNF in the prefrontal cortex of rats receiving a dose of 250mg/kg of mushroom compared to the control group. GDNF expression was also decreased in both the hippocampus and prefrontal cortex tissues. Results also showed an increase in the expression of TNF? in the prefrontal cortex of these rats

Conclusion : This study showed that long-term use of magic mushroom causes a decrease in the expression of neurotrophic factors and an increase in neuroinflammation in the hippocampus and prefrontal cortex of rats. Examining the level of factors involved in mitochondrial biogenesis in the mentioned tissues is proposed as the suggestions of this study.

Keywords : Magic mushroom, Rat, Inflammation, Neurotrophic factors

Count: 415
Abstract ID: 540
subject: Social Neuroscience: Other
Presentation Type: Poster

Investigating the effect of Magic Mushroom (Psilocybe Azurescens) on novel object recognition memory in rats

Submission Author: Elham Ghadyani

Elham Ghadyani[1], Parisa Akbari[2], Elmira Beirami[3], Neda Valian[4], Samaneh Nabavi Fard[5]

1. Nabavi Fard3 1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
2. Nabavi Fard3 1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
3. Nabavi Fard3 1. Department of Animal Biology, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
4. Neuroscience Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Psilocybin, or magic mushroom, occurs naturally and is used for its hallucinogenic effects. They are psychedelic drugs, which means they can affect all the senses and alter a person's thinking, sense of time and emotions. Psychedelics can cause a person to hallucinate, seeing or hearing things that are not there or are distorted. The main ingredient of magic mushrooms is psilocybin. When psilocybin is ingested, it is converted in the body to psilocin, the chemical with the psychoactive properties. Nowadays, the consumption of this mushroom by young people, especially at an early age, has increased greatly. The aim of this study was to investigate the effects of magic mushroom on novel object recognition memory in male Wistar rats.
Methods : In this study rats were randomly divided into four groups: control (treatment with normal saline), 10, 100, and 250 mg/kg doses of magic mushroom. Rats received different doses of magic mushroom for two weeks (every other day) by gavage. Novel object recognition memory (NOR) test was used to evaluate recognition memory.
Results : The results showed that during the familiarization phase of NOR test, the rats in all experimental groups spent equal time searching for two similar objects (A1 and A2) and showed the same desire for both objects, which actually indicated the absence of initial desire for objects in the NOR test. In the examination of short-term memory (STM), the results showed that the rats in the 250 mg/kg magic mushroom group showed less desire for the new object (B) than the control group, indicating the destruction of STM by magic mushroom consumption. Also, in the examination of long-term memory (LTM), the results showed that rats receiving the dose of 250 mg/kg of magic mushroom had a lower tendency to search for a new object (C) than the control group, indicating the destruction of LTM in rats in this group.
Conclusion : Overall, the results of this study showed that long-term use of high doses of magic mushrooms impairs novel object recognition memory in rats.
Keywords : Magic mushroom, Novel object recognition memory, Rat

Count: 416
Abstract ID: 367
subject: Social Neuroscience: Other
Presentation Type: Oral

Evaluation the obsessive-compulsive disorder and social interaction behavior on offspring of parental tramadol abstinent in male Wistar rats

Submission Author: Newsha Hosseini

Newsha Hosseini[1], Mohammad-Reza Zarrindast[2], Ghorbangol Ashabi[3], Mona Hashemzadeh[4], Kimia Taleh Masouleh[5], Roxana Alizadeh[6]

1. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
2. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
3. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
4. Department of veterinary, Garmsar Branch, Islamic Azad University, Semnan, Iran
5. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran
6. Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Iran

Background and Aim : This study aimed to determine, the effects of parental addiction to tramadol on the behavior of offspring, focusing on social interactions and obsessive-compulsive behaviors.

Methods : To create an addiction model, rats were injected with tramadol intraperitoneally for 14 days at a dosage of 2.5 mg per kilogram of body weight. Following the addiction period, the rats underwent a 10-day rest period to experience abstinent. After this period, male and female rats from the addicted and healthy groups were selected for mating, after that they were divided in four groups; G1: Offspring from mating of two tramadol-addicted parents,G2: Offspring from a tramadol-addicted female and a healthy male, G3: Offspring from a healthy female and a tramadol-addicted male, G4: Offspring from two healthy parents and pregnant females were housed in separate cages upon confirmation of pregnancy. The offspring remained with their mother until the end of the nursing period and were then subjected to behavioral tests. Two primary behavioral tests were conducted to evaluate the social and obsessive-compulsive behaviors of the offspring: The social interaction test and the marble burying test. In the social interaction test, the social tendencies of the offspring were assessed in the eighth week after birth. This test was conducted using a three-compartment chamber, where unfamiliar rats were placed in the side compartments. Parameters such as the duration and frequency of direct contact with unfamiliar rats, as well as unusual behaviors like freezing or repetitive actions, were recorded. This test was conducted in two phases, first with one unfamiliar rat and then with a new unfamiliar rat, to evaluate social tendencies and the preference for new social interactions. In the marble burying test, offspring were placed in a

standard cage filled with woodchip bedding, with 12 black marbles systematically arranged on the bedding. The rats were given 30 minutes to explore the cage, and the number of marbles buried was counted. If at least two-thirds of a marble was covered with bedding, it was considered "buried," indicating obsessive behavior.

Results : The results indicated that offspring of tramadol-addicted rats exhibited reduced social interactions compared to control rats and displayed higher rates of obsessive behaviors. In particular, offspring with both parents addicted to tramadol demonstrated significant impairments in social interaction during the social interaction test and buried a greater number of marbles in the marble burying test compared with three other groups.

Conclusion : These findings suggest that parental addiction to tramadol can have long-term impacts on offspring behavior. Such behavioral changes may stem from the long-lasting effects of addiction on the nervous system, which could be transmitted to the next generation. The results emphasize the importance of exploring intergenerational effects of substance addiction and highlight the need for further research to understand the neurobiological mechanisms underlying these behavioral changes, aiming to prevent the intergenerational transmission of addiction-related behaviors.

Keywords : Addiction; Tramadol; Behavioral Test; Obsessive-Compulsive Disorder; Social Interaction

Count: 417
Abstract ID: 361
subject: Social Neuroscience: Other
Presentation Type: Oral

Nitric oxide modulates short and long-term changes in hyperalgesia, anxiety and cognitive deficits induced by empathy

Submission Author: FATEMEH Mohammadi

FATEMEH Mohammadi[1], Mohammad Shabani[2]

1. Student Research Committee, Sirjan School of Medical Sciences, Sirjan, Iran
2. Keman university of medical sciences

Background and Aim : Pain is perceived not only by personal experience but also vicariously through social communication and interaction. Empathy is defined as the capability to comprehend and simulate the feelings of others. Though it has been considered as a human feature, recent studies have demonstrated empathy-like behaviors in other animals including rats.

Methods : We used adult male Wistar rats (n=8 for each group). One sibling received formalin injection into the hindpaw five times within a nine-day period and the other sibling observed the pain while being pretreated with saline, L-NAME, or L-arginine (10 mg/kg, i.p.). 24 h and 7d after the last observation nociception, anxiety and cognition were evaluated. The normality of data was assessed by Ks. For data analysis, we used one-way and two-way ANOVA.

Results : Observing a sibling in pain led to a hyperalgesia, anxiety like behavior and cognitive deficit in the observer 24 h and 7d after the last observation. Nitric oxide system modulated these changes.

Conclusion : Results in the current study demonstrated a modulating effect of NO on empathy induced short and long-term changes in nociception, anxiety and cognition. Further studies addressing the specific brain regions and other neurotransmitters involved are recommended.

Keywords : Empathy, Hyperalgesia, Short and Long-term changes

Count: 418
Abstract ID: 270
subject: Social Neuroscience: Other
Presentation Type: Oral

Morphological alteration of NADPH-d containing neurons in the prefrontal cortex and basolateral amygdala: A study 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 : Our previous study showed that the prefrontal cortex and basolateral nucleus of amygdala (BLA) are involved in emotional processing regarding social ranks in male rats. Our results suggest that dominant social rank is associated with higher anxiety compared to subordinate ranks. Since nitric oxide participates in the modulation of anxiety, the aim of the present study was to investigate the comparative morphological features of NADPH-d neurons in the PFC and BLA of dominant and subordinate ranks.

Methods : The social hierarchy status of sibling male Wistar rats were determined -using tube test- in two categories of dominant and subordinate ranks. Anxiety-like behavior were assessed employing open-field test (OFT) and elevated plus-maze (EPM). In the present histological study, dominant and subordinate male rats (n=4 each) underwent NADPH-d staining technique. In six sections/animal, the number and morphometric properties of nitrergic neurons of the PFC (including: frontal cortex area 2 (FR2), cingulate cortex (Cg), pre-limbic (PL) and infra-limbic (IL) cortical areas), and BLA were quantitatively analysed.

Results : The results revealed that dominant rats with higher anxiety-like behaviors have lower number of nitrergic neurons in the PFC, in exception of IL cortical area. The lower number of tertiary dendritic processes was observed through the PFC of dominant compared to subordinate rats. While in the BLA, these parameters were higher in dominant rats in comparison to subordinate rats.

Conclusion : Our results suggested the differential morphometric features of NADPH-d neurons of PFC and BLA in relation to social hierarchical ranks. The alteration of nitrergic system of these areas may be associated with higher anxiety-like behaviors in dominant rats. To our knowledge no similar results were reported yet.

Keywords : Social ranks; Anxiety-like behaviors; NADPH-d neurons; Male rat

Count: 419
Abstract ID: 175
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

Does gender differences change Silver nanoparticles accumulation pattern in body

Submission Author: Seyedeh Farinaz Saeed

Seyedeh Farinaz Saeed [1], Mohammad Reza Namavar[2]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Histomorphometry and Stereology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Conclusion : Silver nanoparticles (AgNPs) are widely used for medical purposes and as drug-delivery vehicles. AgNPs can reach the brain mostly through intranasal (direct), and oral routes via blood-brain barrier (BBB). BBB is more integrated in females than males. Many studies have concentrated on oral exposure and AgNPs reaching BBB by absorbing in the intestine and reaching circulation. AgNPs pass through BBB via transcytosis; during passing and later in cells, their aggregation and ion production cause inflammation. There are permeability and inflammatory differences when it comes to the size, shape, and morphology of AgNPs. The larger AgNPs are less permeable. AgNPs could cause reactive oxygen species (ROS) production and alter ROS control pathways and protein production which leads to cell apoptosis. Sex differences are one of the parameters that should be considered regarding the accumulation patterns of AgNPs in most tissues. AgNP levels are lower in agonadal rodents (in comparison with males and females) which shows physiological differences led by sex hormones influenced AgNP accumulation and degradation, although hormone levels are unaffected in the presence of AgNPs. High-dose AgNPs accumulate more in female tissues without significant changing the hormone index; conversely, females have a higher tolerance (in comparison to males) for receiving low-dose AgNPs and lower accumulation occurs in their tissues. It has been shown that higher ROS levels in females lead to different inflammatory responses than in males. AgNP degradation rate is also reported to be different between males and females, and it also differs between different tissues. This literature review summarizes the recent findings on how sex differences alter AgNP accumulation and degradation. in conclusion, this literature shows the importance of considering sex difference in developing new drug-delivery systems, specially when it comes to nano based drug delivery systems. According to our review, we suggest to do more research on female subjects; or consider adding two female groups one in control and other in treatment group, to evaluate drug precisely.

Keywords : Silver Nanoparticles; Blood Brain Barrier; Gender; AgNPs; Sex difference; Metal Nanoparticles

Count: 420
Abstract ID: 401
subject: Special topics: Converging Technologies (NBIC: Nano-Biotech-Information-Cognitive), euroscience and Nanotechnology, Neuroscience and Biotechnology, Neural Tissue Engineering
Presentation Type: Poster

A New approach for Optic Nerve decellularization: Review

Submission Author: Fatemeh Hosseinpour

Fatemeh Hosseinpour[1], Ashraf Hassanpour-Dehnavi[2]

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Anatomy, School of Medicine Shiraz University of Medical Sciences, Shiraz, Iran

Conclusion : One of the new approaches now being investigated by researchers involves the development of bioartificial tissues. In this direction, bioengineered tissue will replace or enhance the function of tissues by mainly scaffold-based methodologies, growth factor-based methodologies, and stem cell-based methodologies. Among them, natural scaffolds provide a special microenvironment and mechanical support for cell proliferation and differentiation. Among the major achievements so far is the development of scaffolds based on decellularized extracellular matrix capable of mimicking some properties of normal tissues. Of the different decellularization methodologies, supercritical CO2 has emerged as one of the most promising owing to its high efficiency regarding cell removal with structural preservation of the original architecture of the ECM. It exhibits low critical pressure at 7.38 MPa and a comparably low temperature at 31.1°C, which allows easy penetration even through denser materials. Its intrinsic chemical inertness and nontoxicity, together with its removability without residue, enabled the application of scCO2 as an effective tool in developing natural scaffolds for tissue engineering and regenerative medicine. Supercritical fluid-based decellularization methodologies compared to chemical decellularization in optic nerve regeneration showed better preservation of integrity and mechanical properties of the ECM by supercritical methods. Unsatisfactory treatment methods exist concerning peripheral nerve injuries, while the use of stem cells raises a number of problems regarding cell viability. Synthetic scaffolds very often show a lack of crucial cell-binding properties. Supercritical CO2 gently removes debris and preserves the ECM-very promising in optic nerve regeneration and clinical neuronal differentiation. Thus, supercritical CO2 applied for optic nerve decellurization outperforms all conventional methods in maintaining the structure of ECM and reduces the duration of treatment. Preservation of ECM is very important in neuronal regeneration. Supercritical CO2 gently removes the debris, retains the components of ECM, and hence acts as a bactericidal agent, promising much for the regeneration of optic nerves and better outcomes in the treatment of neural tissue damages. This research investigates using pressurized CO2 with aqueous ethanol for delipidating porcine retina tissue. This process aims to create effective bioscaffolds in retinal repair by removing lipids while preserving ECM for tissue regeneration. It significantly reduces treatment time and acts as a bactericidal agent. This innovative method shows promise in retinal repair and could revolutionize treatments for optic nerve damage—another exciting development in nerve-related regenerative medicine.

Keywords : Supercritical carbon dioxide, decellularization, Optic nerve, scCO2

Count: 421
Abstract ID: 349
subject: Special topics: Neuro-aesthetics, Art and Creativity
Presentation Type: Poster

Visual Art Preferences in Schizophrenia

Submission Author: Anoosha Nasertaheri

Anoosha Nasertaheri[1], Dr Abdolhossein Vahabi[2], Dr Reza Rostami[3]

1. University of Tehran
2. University of Tehran
3. University of Tehran

Background and Aim : Schizophrenia (SCZ) is a chronic mental disorder characterized by cognitive, emotional, and perceptual disturbances, including anhedonia and impaired visual cognition. While schizophrenia is strongly associated with impaired visual processing, little is known about how individuals with this condition experience visual art. Aesthetic preferences for complex visual stimuli, such as paintings, can reveal how people engage with and interpret the visual world. This study aimed to investigate how SCZ patients differ from healthy controls (HC) in their aesthetic preferences for paintings across five art styles. Additionally, we explored the impact of mood on these preferences and how engagement with art influences emotional states.

Methods : 17 hospitalized SCZ patients from Razi Psychiatric Hospital and 31 healthy controls (HC) participated over six months. Mood was assessed with the Positive and Negative Affect Schedule (PANAS) before and after the liking rating task. Participants completed a computer-based liking rating task, rating 150 paintings across five styles—Impressionism, Expressionism, Cubism, Abstract, and Colorfield—on a 5-point Likert scale from "unpleasant" to "pleasant." The paintings were shown in three randomized blocks of 50, balanced across genres. Data was analyzed using General Linear Models (GLMs) and Mann-Whitney U tests to compare mood and liking ratings. Representational Similarity Analysis (RSA) was used to examin patterns of aesthetic preference.

Results : Mood assessments using PANAS revealed a significant decrease in negative mood post-task for both SCZ and HC groups (SCZ: $U = 7.5$, $P < 0.05$; HC: $U = 99.5$, $P<0.01$), with HC also showing an increase in positive mood ($U =67.5$, $P<0.05$). Mann-Whitney U tests indicated that SCZ patients rated Cubism ($U = 205025$, $P<0.05$), Expressionism ($U = 217681$, $P <0.01$), and Colorfield ($U = 210977$, $p <0.01$) significantly more favorably than HC. Logistic regression analysis indicated that positive mood scores in the pre-task phase significantly predicted higher painting ratings ($\beta = 0.0217$, $SE = 0.003$, $z = 6.956$, $p < 0.001$). RSA conducted on the ratings of 150 paintings revealed that SCZ patients rated Expressionist paintings more homogeneously compared to HC. The similarity matrices and heat maps showed stronger clustering in SCZ patients' ratings for Expressionism, indicating shared preferences within the group, while HC ratings were more variable.

Conclusion : This study reveals that SCZ patients exhibit heightened aesthetic appreciation for visual art compared to healthy controls, particularly favoring Expressionism, Cubism, and Colorfield genres. These findings challenge existing literature by suggesting that altered visual processing may not inherently diminish aesthetic pleasure in SCZ. Furthermore, engagement with art positively impacts mood, highlighting its potential therapeutic value in clinical settings and emphasizing the need for further exploration of art's role in enhancing emotional well-being among psychiatric populations.

Keywords : Schizophrenia; Aesthetic preference; Visual Art

Count: 422
Abstract ID: 186
subject: Special topics: Neuroethics
Presentation Type: Poster

Long-term use of magic mushroom (Psilocybe Azurescens) increases neuroinflammation and oxidative stress in rats

Submission Author: Hediye Moghadam

Hediye Moghadam[1], Elmira beirami[2], Neda valian[3], Samaneh nabavi fard[4]

1. Kharazmi University, Tehran, Iran
2. Kharazmi University, Tehran, Iran
3. Shahid Beheshti University of Medical Sciences, Tehran, Iran
4. Institute of Police Sciences and Social Studies, Tehran, Iran

Background and Aim : Magic mushrooms are among the mushrooms that occur naturally and are used as a hallucinogenic drug. Since the use of this mushroom has recently attracted the attention of many young people, the aim of this study was to investigate the effect of long-term use of magic mushroom on oxidative stress and neuroinflammation factors in male Wistar rats.

Methods : The rats were divided into 4groups: control (treatment with saline), doses of 10,100 and250mg/kg of magic mushroom. Different doses of magic mushroom were injected by gavage for 2weeks (every other day). According to the results of the behavioral tests, the dose of 250mg/kg of magic mushroom was selected for molecular studies. The expression level of ROS and SOD, as oxidative stress factors, and IL-6, as an inflammatory factor, in the hippocampus and amygdala tissues of rats was measured by ELISA.

Results : The results showed a significant increase in the expression of ROS and a decrease in the expression of SOD in the hippocampus and amygdala tissues of rats receiving the dose of 250mg/kg of magic mushroom compared to the control group. Also, the results showed that the level of IL-6 in both hippocampus and amygdala tissues of rats receiving the dose of 250mg/kg of magic mushroom increased compared to the control group.

Conclusion : Generally, this study showed that long-term use of magic mushroom causes oxidative stress and neuroinflammation in the hippocampus and amygdala tissues of rats. Evaluating the expression level of neurogenesis factors in the mentioned tissues is proposed as the suggestions of this study.

Keywords : Magic mushroom, Oxidative stress, Neuroinflammation, Rat

Count: 423
Abstract ID: 234
subject: Special topics: Public Awareness
Presentation Type: Poster

Incidence and mortality of primary brain and central nervous system tumors: a population-based forecast modeling from 2022 to 2045

Submission Author: Yosra Vaezgharamaleki

Yosra Vaezgharamaleki[1], Mohammad-salar Hosseini[2], Sarvin Sanaie[3]

1. Hematology and Oncology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
2. Research Center for Integrative Medicine in Aging, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran
3. Neurosciences Research Center, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran

Background and Aim : Primary brain and central nervous system (CNS) tumors are abnormal growths that originate within the brain or spinal cord, distinct from metastatic tumors that spread from other body parts. Consisting of various subtypes, such as gliomas and meningiomas, these tumors present with size-dependent clinical symptoms, including headaches, seizures, cognitive changes, and motor difficulties. Considering the alarming increase in the number of CNS tumor cases, we aim to evaluate the epidemiological patterns of CNS tumors in 2022 and the projected burden in 2040.

Methods : Data on primary brain and CNS tumors were retrieved from the International Agency for Research on Cancer GLOBOCAN 2022 database (v 1.1). Primary CNS tumors were defined per International Classification of Diseases version 10 (ICD-10) codes C70-C72. Projected estimations up to 2045 were calculated based on demographic projections, stratified by World Health Organization (WHO) regions and Human Development Index (HDI), and presented as age-standardized incidence (ASIR) and mortality (ASMR) rates per 100,000 population. WHO regions were labeled as the African Region, the Eastern Mediterranean Region, the South-East Asia Region, the Region of the Americas, the Western Pacific Region, and the European Region. HDI was divided into four tiers: very high HDI, high HDI, middle HDI, and low HDI.

Results : A total of 321,624 new CNS tumor cases and 248,403 deaths are estimated in 2022, with a 3.5 ASIR worldwide. Men had higher incidence (53.99%) and mortality (56.27%). WHO Europe region leads the incidence with an ASIR of 5.6, followed by Americas region with 4.2, Western Pacific region with 3.8, East Mediterranean region with 3.7, South-East Asia region with 2.1, and Africa region with 1.4 (Figure 1). In the case of mortality, however, the Europe region is followed by Eastern Mediterranean region and Americas region with 4.1, 3,4, and 3.1 estimated ASMR, respectively (Figure 1). A higher HDI is associated with higher ASIR of CNS tumors, with the very high and high HDI countries reporting an ASIR of 4.9 and 4.0, followed by the middle HDI (2.3) and low HDI (1.6) countries (Figure 2). The estimated number of new cases is expected to rise from 2022 to 2045, with the highest increase expected in the WHO Africa (+93.4%), East Mediterranean (+75.1%) and South-East Asia (+48.9%)

regions. The increase is expected to impose a higher burden on women, which is potentially attributed to the demographic shift (Figure 3). Meanwhile, WHO Western Pacific and Europe regions are expected to maintain the highest incidence, with an estimated overall incidence of 139,546 and 93,360 patients, respectively (Figure 3).

Conclusion : Our study underlines the disproportionate burden of CNS tumors, whereas some regions, such as the East Mediterranean, show disproportionately higher mortality rates. The burden of CNS tumors is set to rise in the upcoming decades, and timely interventions to provide high-quality diagnostic, therapeutic, and palliative care are inevitable.

Keywords : Brain neoplasms; Burden of cancer; Cancer epidemiology; Central nervous system neoplasms; CNS tumors

Count: 424
Abstract ID: 310
subject: Covid-19 and Nervous System: Basic and Clinical Aspects: Covid-19 and Nervous System: Basic and Clinical Aspects
Presentation Type: Poster

Could The Rehacore software help for the purpose of neurobiological feedback (Polyvagal theory (PVT)) in CoVid-19 pandemic to improve the sleep quality of pregnant mothers

Submission Author: Mohammadjavad Hoseinpourfard

Mohammadjavad Hoseinpourfard[1], Mohammadjavad Hoseinpourfard[2]

1. Institute for Cognitive Science Studies, Tehran, Iran.
2. Baqiyatallah University of Medical Sciences, Institute for System Biology and Personalized Medicine, Neuroscience Research Center, Tehran, Iran.

Background and Aim : Improving the development and development of babies and pregnant mothers is one of the major issues of the mental health system. In this study, we tried to investigate the relationship between the quality of sleep of pregnant mothers in the last month of pregnancy and the health of babies. The statistical population of pregnant mothers in 1401 was in the cities of Tabriz and Tehran.

Methods : The sample size is 156 people. The size of sample achieved by using the available method (Morgan's table used for sample size). Collecting data done by pregnant mother that admitted in Glen View health service providers in Tabriz and Tehran. The data related to the quality of the mother's sleep with the Pittsburgh Questionnaire and the Apgar Index and the neonatal weight, they examined by obstetrics and midwives after delivery and are included in the newborn's profile sheet, the intervention of this study. Regular deep abdominal breathing with a pulse on heart rate variability measured by the Rehacore software. The normality of the distribution of the variables checked with the Kolmogorov-Smirnov tool and to measure the correlation, the Pearson coefficient and the point-to-point correlation coefficient used the SPSS23 software.

Results : The relationship between the quality of the mother's sleep and the baby's weight, as well as the Apgar components, except for the breathing component, was significant and direct.

Conclusion : The result is that improving the health of newborns in terms of birth weight and Apgar score related to the quality of the mother's sleep during pregnancy, and it recommended paying attention to this importance to all policymakers and managers of the mental health system.

Keywords : Rehacore Software; Polyvagal Theory; Sleep Quality; PSQI; Pregnant Mothers; Heart Rate Variability; Neonatal Apgar