BOOK of Abstracts

9th Basic and Clinical Neuroscience Congress

December 9-11, 2020 Virtual Congress

Count: 213
Abstract ID: 158
Subject: Development: Other
Presentation Type: Poster

Maternal separation: consequences of adolescent methylphenidate exposure

Submission Author: Fatemeh Mohtashami Borzadaran

Fatemeh Mohtashami Borzadaran[1], khadijeh Esmaeilpour[2], Vahid Sheibani[3]

1. Kerman Neuroscience Research Center
2. Kerman Neuroscience Research Center
3. Kerman Neuroscience Research Center

Background and Aim: Methylephenidate (MPH) is considered as a drug for treatment of attention deficit hyperactive disorder (ADHD). However, it can also be a drug of abuse. Some studies suggest that negative consequences of addiction and drug abuse are more prevalent among people with early life experience of adversity.
Methods: Maternal separation (MS) is an animal model designed to mimic early life adversities. In this model rats are separated daily from their mother for 3 hours from day 1 (PND1) until the last weaning day which is day 21 (PND21). To address the question of early life stress and its impact on addiction and drug reward, we used a seven-day conditioned place preference test (CPP) in combination with maternal separation. CPP was designed with three stages. A ten-minute habituation time was given on Day 1, conditioning took place on Day 2Day 6 (5 mg per kg MPH injection in drug compartment and saline in saline compartment with 4 hr gap between injections). The test day for CPP was ten minutes on Day 7. The CPP scores were calculated as indicators of drug reward. CPP testing started on PND34, known as mid adolescence. In addition we needed to investigate the combinatory impact of early life adversity using MS model and drug abuse on sensory pain perception. Sensory pain perception was evaluated using hot plate and tail flick test after 5 days MPH exposure with 5mg per kg starting on PND34. Hence, rats were exposed to maternal separation and then treated with MPH. control and MS groups treated with MPH and without MPH were compared for CPP and sensory pain tests.
Results: It was revealed that MS and control female rats are equally prone to addiction with 5mg per kg MPH. There is no significant difference in the reward score they experience. On the other hand, MS females exposed to MPH experience more pain in tail flick test. Experiencing MPH similarly declined hotplate pain perception in MS and controls in the females. The male MS groups experience higher reward in CPP, however pain perception did not differ among groups.
Conclusion: Results indicate that MS can alter experienced drug reward in male group and pain perception in female group.
Keywords: maternal separation, addiction, pain perception

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Count: 12
Abstract ID: 118
Subject: Cognition: Learning and Memory **Presentation**
Type: Oral

Maternal separation impacts on long-term synaptic potentiation

Submission Author: Khadijeh Esmaeilpour

Khadijeh Esmaeilpour[1], Vahid Sheibani[2], Sara Joushi[3]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
2. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
3. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim: Mother-infant interactions influence the development of physiology and behavior during the first weeks after birth. As an adverse early life experience, maternal separation (MS) produces behavioral and neuroendocrine functions disorders associated with the hippocampus. Considering the critical role of long-term potentiation (LTP) in learning and memory, we investigated whether MS affects LTP in adolescent rats.

Methods: In this study, rat pups were exposed to daily 3-h (MS180) or 15-min (MS15) periods of maternal separation on postnatal days (PND) 1–14 and control offspring remained with the dams all the time before weaning. Extracellular evoked field excitatory postsynaptic potentials (fEPSPs) were recorded in the stratum radiatum of the CA1 area of the slice at 28–35 days of age.

Results: Our results indicate that a significant difference existed in the magnitude of LTP between the control group and MS180 group, but the MS15 group was not different from control.

Conclusion: In conclusion, these findings suggest that MS may impair LTP induction in the CA1 area of the hippocampus in adolescent rats.

Keywords: Maternal separation, Learning and memory, Hippocampus, LTP

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Abstract ID: 29
Subject: Neuropsychiatry and Psychology: PTSD **Presentation**
Type: Poster

Naloxone modified facial formalin induced pain in rat model of Posttraumatic stress disorder

Submission Author: Marjan Nikbakhtzadeh

Marjan Nikbakhtzadeh[1], Vahid Sheibani[2], Khadijeh Esmaeilpour[3], Khadijeh Moradbeygi[4], Elham Zahedi[5]

1. Department of Physiology, School of Medicine, Tehran University of Medical Science, Tehran, Iran
2. Kerman Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
3. Kerman Neuroscience Research Center, Neuropharmacology Institute, Kerman University of Medical Sciences, Kerman, Iran
4. Department of Physiology, School of Medicine, Tehran University of Medical Science, Tehran, Iran
5. Department of Physiology, School of Medicine, Tehran University of Medical Science, Tehran, Iran

Background and Aim: PTSD (Post-traumatic Stress Disorder) is a common chronic stress which changes the HPA (Hypothalamus-Pituitary-Adrenal) axis and induced anxiety-like behavior. The symptoms of PTSD have comorbidity with facial pain problem. Naloxone as an opioidergic antagonist has reciprocal effect on the pain threshold.

Methods: In this study, we induced SPS as a model of PTSD and for confirming the SPS induction; we used the elevated plus-maze and dexamethasone suppression test. According to the relation that existed between PTSD and facial pain, chronic facial pains were evaluated by the formalin injection to the SPS and control groups. Naloxone was also injected 30 minutes before formalin in both groups to find naloxone effects on facial pain alone in control group and SPS and facial pain combination in another.

Results: Our results showed that anxiety-like behavior increased in SPS group compared to control, but corticosterone concentration reduced versus control. Chronic pain reduced after the formalin injection in SPS compared to control ($P<0.001$). Naloxone had an anti-nociceptive effect on control group ($P<0.001$) but does not have the same effect on SPS group at three phases of pain ($P<0.001$).

Conclusion: Therefore the role that is masked behind the curtain of endogenous opioids may be justified the analgesic effects of PTSD. But the result that is seen from naloxone is dual and that is because of the naloxone interference with the opioids characteristics.

Keywords: Chronic pain; Post-traumatic stress disorder; Naloxone; Single prolong stress; Rat

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Subject: Neural Injuries and Neurodegenerative Disorders: Traumatic Brain Injury

Presentation Type: Poster

The Effect of Estrogen on Inflammatory and Oxidative Stress Factors in Diffuse Axonal Injury: A Clinical Trial

Submission Author: Nazanin Sabet

Nazanin Sabet[1], Zahra Soltani[2]

1. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran

2. Endocrinology and Metabolism Research Center, Institute of Basic and Clinical Physiology Sciences, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran

Background and Aim: Neuroprotective effect of estrogen in traumatic brain injury (TBI) has been shown in many animal studies. This clinical trial was designed to investigate the effect of estrogen on inflammatory and oxidative stress factors in diffuse axonal injury (DAI).

Methods: Frothy- eight male patients 18-60 years with moderate to severe DAI admitted within the first 4 hours of injury were randomly divided into control and estrogen groups. The estrogen group received orally 1.25 mg conjugated estrogen within four hours of brain injury and four days consecutive in addition to standard treatment. Serum concentrations of proinflammatory (Interleukin-1β (IL-1β), Transforming growth factor (TGF-β)) and oxidative stress (Malondialdehyde (MDA), Protein carbonyl (PC), Total antioxidant capacity (TAC)) factors were evaluated immediately, and one and six days post-injury.

Results: There was no significant difference in serum MDA level between the control and estrogen groups at 1 and 6 days post injury, There was an increase in serum IL- 1β level in the estrogen group compared to the control group at 1 and 6 days after DAI ($P < 0.001$). Also, an increase in serum TGF-β level was observed in the estrogen group compared to the control group at 1 and 6 days after injury ($P < 0.001$). There was an increase in serum protein carbonyl level in the estrogen group compared to the control group at 1 and 6 days after DAI ($P < 0.001$).This factor increased between the estrogen group at six days after injury compared to one days after injury ($P < 0.05$). Serum TAC level increased in the estrogen group compared to the control group at 1 and 6 days after injury ($P < 0.01$).

Conclusion: The findings of this study showed the treatment of estrogen increases the ratio of antioxidant to oxidant and also anti-inflammatory to inflammatory factors in DAI patients. Therefore could be neuroprotective through antioxidant and anti-inflammatory effects .A study with larger sample size is needed to confirm the efficacy of estrogen in DAI.

Keywords: Estrogen; Diffuse axonal injury; Protein carbonyl; Malondialdehyde; Total antioxidant capacity; Interleukin1-β; Transforming growth factor