The 1st International Neuroinflammation Congress and 1st Student Festival of Neurosience
Shefa Neuroscience Research Center, Tehran, Iran, 11-13 April, 2017
The Neuroscience Journal of Shefaye Khatam
Volume 5, No. 2, Suppl 2

Poster Presentation

Neuroinflammation: A Common Phenomenon between Chronic Pain and Opioids

Fatemeh Younesi Soltani[1,2*], Fateme Salahshor[2], Hassan Abbassian[3]

[1]Department of Physiology, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran
[2]Islamic Azad University, Mashhad Branch, Mashhad, Iran
[3]Department of Neuroscience, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Published: ***11 April, 2017***

Abstract

Chronic pain is a prevalent and debilitating condition, conveying immense human burden. Suffering from chronic pain is not only caused by painful symptomatology, but also through a wide range of psychopathological and physical consequences, including depression and anxiety disorders, impaired sleep and cognition, cardiovascular morbidity and impaired sexual function, all contributing to diminished quality of life. Opioids are highly effective analgesics because they target both of sensory and emotional elements, by inhibiting pain pathways and alleviating negative affect (including depression) by engaging reward or hedonic pathways. Prolonged exposure to an opioid induces hyperalgesia and tolerance, which negatively affect pain management in turn and significantly hamper the application of opioids. Neuroinflammation occurs in a wide range of neurological disorders -from central nervous system (CNS) infection and trauma to neurodegenerative diseases and psychiatric disorders. Recently demonstrated that chronic opioid administration in rats induces a robust neuroinflammatory response via toll-like receptor 4 (TLR4) signaling in the periaqueductal gray (PAG), a key site for opioid-mediated analgesia, that drives tolerance. Morphine is a powerful analgesic for treating severe pain, Morphine tolerance is a complex physiologic process, and various mechanisms have been proposed, such as glutamatergic receptor activation and neuroinflammation. In various preclinical chronic pain models, cytokines and neurotrophic factors have been identified as pivotal mediators involved in neuroimmune activation pathways and cascades, and in neuron–glia interactions. Both chronic pain and chronic opioids promote neuroinflammation in limbic brain structures leading to the genesis of negative affective states. This negative effect may increase the likelihood of opioid misuse and addictive-like behaviors in the chronic pain population. Understanding the mechanisms underlying opioid-induced neuroinflammation is paramount to developing effective pain management strategies that minimize the risk of dependence, abuse, and long-term consequences of chronic neuroinflammation.

Keywords: Chronic pain, Opioids, Neuroinflammation, Cytokines

Corresponding Author: Fatemeh Younesi Soltani
E-mail: *fatemeys.1992@gmail.com*

[Downloaded from shefayekhatam.ir on 2026-11-28]