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

Oral Presentation

Anti-Inflammatory Approach to Epilepsy Treatment

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

Abstract

Epilepsy is one of the most common neurologic diseases around the world and more significantly in Iran (0.4-1 % worldwide and 5% in Iran). Almost one-third of these patients suffer from treatment-resistant epilepsy, which reduces their quality of life by recurring epileptic onsets. There are different approaches for the treatment of both treatment-resistant and treatment-nonresistant epilepsy, including drug therapy (Carbamazepine, Diazepam, Eslicarbazepine, Felbamate…), surgery and diet therapy (ketogenic diet), most of which focusing on symptomatic or palliative treatments. Yet the main pathways leading to epilepsy attacks remaining intact. In recent year's evidence have been found suggesting inflammatory mediators might be involved in epileptogenesis. Dr.Vezzani have proved in epilepsy, inflammatory cytokines such as IL-1b, HMGB1 or S100beta are overexpressed in diseased tissues and IL-1b and HMGB1 act as pro-convulsant factors in various seizure models by decreasing the threshold.(Epilepsy and Inflammation in the Brain: Overview and Pathophysiology). In another study she states after a brain seizure, pro-inflammatory cytokines including IL-1β, TNF and IL-6 are over-expressed in micro-glia and astrocytes decreasing excitability threshold afterward. Walker and Sills also add Toll-like receptor signaling pathways as a key mediator resulting in epilepsy. In light of these new findings, a new approach for curing treatment-resistant epilepsy is making its way among other approaches. Inhibitory drug VX-765, an interleukin converting enzyme inhibits the formation of IL-1b, the cytokine involved in epileptogenesis. In a randomized, double-blind, placebo-controlled study enrolling 60 adults with treatment-resistant partial onset epilepsy, the end result showed a statistically insignificant difference. However, a 9-13% reduction in seizure rates were observed. To conclude, anti-inflammatory treatment approach to epilepsy and using inflammatory mediator affecting drugs seems to be a promising area, aiming to treat the main causes of epilepsy.

Keyword: Epilepsy, Inflammation, VX-750, Interleukin converting enzyme

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