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Poster Presentation

Potential Therapeutic Targets Related to Neuroinflammation in Treatment and Prevention of Autism

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Abstract

Autism spectrum disorder (ASD) is a mental condition, present from early childhood, characterized by great difficulty in communicating and forming relationships with others and using language. In the last four decades many studies have shown that immune responses in different regions of brain play an important role in ASD pathogenicity. A conservative estimate based on the research suggests that a great percentage of patients with ASD have microglial activation or neuroinflammation. Microglial activation or dysfunction affects neural development and results in neurodevelopmental disorders like ASD. Powerful immune-modulators like poly unsaturated fatty acids (PUFAs) and specially n-3 PUFAs exerting anti-inflammatory properties are important during brain development. Omega-3 fatty acids have an important role in neurogenesis, neurotransmission and protection from oxidative stress. Some of these effects are mediated by inhibiting the formation of prostaglandin E2 from arachidonic acid (an omega-6 PUFA). So PUFA deficiency during pregnancy can cause neurodevelopmental disorders including ASD in children. Considering the fact that most of patients with ASD have neuroinflammation and possibly immune responses in the brain is an important part of ASD emergence, curing the inflammation by inhibiting microglial cells and reducing pro-inflammatory cytokines, can be effective to improve symptoms. A recently published article showed that Fingolimod (FTY720) administration to autism rat models can cause improvement in behavior, learning and memory by inhibiting activation of microglial cells and lowering the level of pro-inflammatory cytokines like interleukin-1β (IL-1β) and IL-6 in the brain and reduces neuronal loss and apoptosis of pyramidal cells in hippocampus. So more studies needed to prove the effect of this drug on the treatment of ASD and finding new ways to inhibit microglial activation to stop neuroinflammation. PUFAs play a vital role in neurodevelopment by immunomodulation so it is suggested that an improved diet including enough amounts of PUFAs during pregnancy can be profoundly effective to prevent ASD in children.

Keywords: Autism spectrum disorder, Neuroinflammation, Poly unsaturated fatty acids, Brain development

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