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Brain Inflammation and Autism: Exploring the fascinating pathways for the cerebellum's neurodevelopmental effects

Husham Bayazed
Consultant of Immunology, Kurdistan Region-Iraq

While the exact cause of autism remains unknown, the goal of this presentation is to shed light on new exciting research and findings that connect brain inflammation with autism in young children and describe the exact changes that happen at the cellular brain level during development that cause ASD. Interestingly, in late 2023 (Ament S.A. et al.), a study utilizing the new technology of single-cell genomes studied the brains of autistic children who died from inflammatory conditions, such as infections or asthma. The study discovered alterations and disruptions in the maturation and functions of neurons within the cerebellum. The study primarily focuses on the Purkinje and Golgi neurons, both of which play crucial roles in development, including cognitive and emotional control, and the coordination of communication among cerebellum cells. Following inflammatory disorders, there are higher levels of pro-inflammatory cytokines, which can cause damage to the delicate neurons in the brain and prevent their complete maturation. The new study, for the first time, looked at the cerebellum, since it is the first brain region to develop and the last to reach maturation during pregnancy and it is responsible for all neurocognitive disorders distorted in children with autism. Indeed, this new technology of single nuclear RNA sequencing has the potential to directly observe changes in the brain at the cell level, making it a breakthrough in neuroscience research. This explains how inflammation plays a crucial role in autism and other neurodegenerative diseases. This exciting research sheds light on potential avenues for the prevention and early intervention of infections in children to prevent autism. However, further research is necessary to validate this insightful connection and determine whether targeting inflammation could prevent its impact on brain development in an autistic child.

Biography

Prof Dr. Husham Bayazed is now a Consultant Immunologist at the College of Health Sciences, Cihan University Duhok- Kurdistan Region / Iraq. He is interested in clinical Immunology, Autoimmunity, and onco-immunology and has published more than 25 papers in reputed international journals in the United States, Europe, ESMJ of WHO, ...etc. Has been serving as a scientific reviewer of many local and international medical journals in addition to being a Fellowship of the International Society of Chemotherapy, Infection, and Cancer (ISC). Moreover, being an Immunology Advisory Board Member of EUROMDnet, Membership of the World Stroke Organization, Membership of Metabolomics (USA), and Membership of the American Association of Science & Technology.

bayazed53@gmail.com

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