The possible role of sodium leakage channel localization factor-1 in the pathophysiology and severity of autism spectrum disorders

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ABSTRACT

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social, stereotypical, and repetitive behaviors. Neural dysregulation was proposed as an etiological factor in ASD. The sodium leakage channel (NCA), regulated by NLF-1 (NCA localization factor-1), has a major role in maintaining the physiological excitatory function of neurons. We aimed to examine the level of NLF-1 in ASD children and correlate it with the severity of the disease. We examined the plasma levels of NLF-1 in 80 ASD and neurotypical children using ELISA. The diagnosis and severity of ASD were based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), Childhood Autism Rating Score, Social Responsiveness Scale, and Short Sensory Profile. Then, we compared the levels of NLF-1 with the severity of the disease and behavioral and sensory symptoms. Our results showed a significant decrease in the plasma levels of NLF-1 in ASD children compared to neurotypical children ($p<0.001$). Additionally, NLF-1 was significantly correlated with the severity of the behavioral symptoms of ASD ($p<0.05$). The low levels of NLF-1 in ASD children potentially affect the severity of their behavioral symptoms by reducing neuron excitability through NCA. These novel findings open a new venue for pharmacological and possible genetic research involving NCA in ASD children.