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Abstract Topic:- Pharmacogenetics

Abstract Title:- Altered gene expression study of glutamate NMDA and AMPA encoded genes in autistic behavior caused by valproic acid model treated with polyherbal formulation.

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Aims:-The current study aims to look at the altered gene expression of glutamate receptor subunit encoded genes NMDA (N-methyl-D-aspartate) and AMPA (-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid). In a valproic acid (VPA) model of autism spectrum disorder (ASD) caused rat, polyherbal formulation had a neuroprotective effect.

Methods:- The purpose of this study was to see how a polyherbal formula containing various neural protective plants influenced autistic-like behaviors caused by valproic acid (VPA) injection. Behavioral analysis was performed on all experimental groups (three chamber sociability test, open field analysis, elevated plus maze, and Y-maze test). The excitatory-inhibitory imbalance theory of autism and the crucial functions that GABA and glutamate play in the early development of neural circuits led us to formulate. The altered mRNA expression of the gene encoding the NR2A (GluN2A) NMDA receptor subunit, and NR2B(GluN2B) and AMPA receptors subunit encoded the gene GluR1 was assessed using rt-PCR to investigate the mechanism of the polyherbal formula's neuroprotective impact.

Results:- The excessive grooming, repetitive and social interaction behavior in the VPA-treated group was significantly corrected by polyherbal formula (VPA+ polyherbal formula) animals compared with the VPA-treated rats.

Rt-PCR: The preliminary results showed that there was a substantial increase of NMDA and AMPA mRNA expression in the VPA group compared to the saline treated group. However, we hypothesized the polyherbal formulation may downregulate the genes level after postnatal treatment of polyherbal formulation.

Conclusions:- The present study concluded that polyherbal formulation can be a potential candidate for ameliorating the ASD symptoms in rats acts via the down-regulated NMDA and AMPA receptor expression.

Keywords:- Autism spectrum disorder, valproic acid, NMDA, AMPA, and glutamate.