Withania somnifera root extract ameliorates valproic acid induced neurochemical and histopathological impairment in autistic rats

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Introduction: Autism is a neurodevelopmental disorder characterized by the disruption of cognition and sociability and increased anxiety like behavior. Iron deficiency in pregnant female also causes increased level of corticotrophin releasing hormone that establishes construct validity in ASD animal model. The present study was designed to evaluate the beneficial effects of *W. somnifera* root extract (WSRE) and risperidone pre-supplementation on experimental model of autism spectrum disorder (ASD).

Methods: ASD was induced in the rats by in-utero exposure of VPA (600 mg per kg) on gestation day 12.5. The pups were treated with 2.5 mg per Kg Risperidone and 40 mg per Kg *W. somnifera* alone and in combination for 30 days. Immunohistochemistry was performed for 5HT and GABA-A Beta using anti-rat primary antibody and HRP conjugate secondary antibody counterstained by Hematoxylin and rat's hippocampus was studied in histology.

Results: ASD animals showed significant impairment in cognitive and sociability functions.

Neurobehavioural changes were accompanied by disturbed molecular and histological evidence in the ASD animals. Presupplementation of WSRE and risperidone combination for 30 days was effective in restoring increased level of 5HT and reduced level of GABA-A Beta in both normal and iron deficient diet ASD animals. Risperidone and *W. somnifera* treated group also showed minimal loss of neurons in CA1 and CA2 regions.

Conclusion: The results of the study showed a protective effect of WSRE on molecular and histological deficit by ameliorating oxidative damage induced by in-utero VPA exposure in ASD rats and are suggestive of its potential application in ASD management.

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