ORIGINAL ARTICLE

Prenatal Supplementation with Curcuma longa Ameliorates Oxidative Stress, Improves Behaviour and Hippocampal Alterations in Valproic Acid-Induced Autism in Sprague-Dawley Rat

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ABSTRACT

There is growing global number of persons affected with autism, and teratogenic influences arising from several epigenetic factors have been implicated. This study aimed to determine the effect of prenatal supplementation of extract of Curcuma longa on valproic acid-induced model of autism in Sprague-Dawley rats. Thirty pregnant Sprague-Dawley rats divided into five groups (n=6) were used. Valproic acid (500 mg/kg body weight) induced autism on gestation day 12.5. The groups were designated as control, valproic acid, and valproic acid with 5, 10 and 20 mg/kg body weights Curcuma longa respectively, (Curcuma longa was administered from day 1-21 of gestation). On postnatal day 21, five male pups were randomly selected from each group, and neurobehavioral tests were performed until postnatal day 28. The pups were sacrificed on postnatal day 28, and the hippocampus was dissected for histology and biochemical assays. Treated groups showed improvement in anxiety and social behaviour. The histological sections showed fewer atrophied cells, reduced degree of chromatolysis with better delineation of the cells within the pyramidal layer compared with valproic acid group. Dopamine, IL-6 and TGF β1 levels were not significantly different from control. Malondialdehyde and glutathione values of the treated groups were significantly different from valproic acid groups. Superoxide dismutase and catalase showed no significant difference when treated groups were compared to valproic acid group except the medium dose for catalase. This study shows that prenatal supplementation with Curcuma longa is a potential ameliorative agent against teratogenic epigenetic agents that may lead to autism.

Key words: Curcuma longa, Valproic acid, Autism, Anxiety, Epigenetic, Social behaviour

INTRODUCTION

Autism is an idiopathic developmental disorder that is majorly characterized by deficits in social interaction and communication, alongside stereotyped behaviours with restricted interests (Won et al. 2013). There is a global rise in the prevalence of the disorder, being common in males than females in a 3:1 ratio (Loomes et al. 2017). In Nigeria, Autism has been shown to occur at a rate of 11.4% among children with developmental disabilities (Bakare et al. 2012). Autistic features have been successfully mimicked with the generation of several rodent models. Valproic acid-induced model of autism is one of the non-genetic models of autism, used to investigate the neurobiology underlying autistic behaviour (Nicolini and Fahnestock 2018; Patterson...
REFERENCES


Curcuma longa ameliorates autism disorder


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