Morus alba leaf extract improves autistic-like symptoms and changes of neurotransmitters, oxidative stress status and brain damage in prefrontal cortex and hippocampus of rat model of autism induced by valproic acid

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Statement of the Problem: Currently, the mechanism-based strategy against autism has gained much attention. Based on the crucial roles of oxidative stress status and brain histopathological changes together with the neurotransmitter changes in autism pathophysiology, the effect of Morus alba, a plant reputed for neuroprotective effect has been considered. Therefore, this study aimed to determine the effect of M. alba leaf extract on the changes of oxidative stress status, neurotransmitters and histology of prefrontal cortex and hippocampus of valproic-rat model of autism.

Methodology & Theoretical Orientation: Rat model of autism was induced by prenatal administration of Valproic Acid (VPA; 400 mg/kg BW) on Gestational Day 12.5 (GD). Then, VPA exposed pups were orally given M. alba leaf extract at doses of 10, 50 and 250 mg/kg between PND14-PND40. They were assessed autistic-liked behaviors and at the end of study, oxidative stress status including Malondialdehyde (MDA) level and the activities of Superoxide Dismutase (SOD), Catalase (CAT) and glutathione peroxidase (GSH-Px) together with the changes of Monoamine Oxidase A (MAO-A) and Acetylcholinesterase (AChE) in prefrontal cortex and hippocampus were assessed. In addition, the densities of neurons in both areas were also explored.

Findings: The extract successfully mitigated autism-like symptoms and decreased oxidative stress status and the activities of AChE and MAO-A in aforementioned areas. The neuron densities of both areas also increased. Therefore, our results suggested that M. alba extract could improve autistic-like behavior partly via the improvement of monoaminergic and cholinergic systems by suppressing AChE and MAO-A and via the increased survival neurons in prefrontal cortex and hippocampus via the increase in CAT and GSH-Px activities resulting in the reduction of MDA, a lipid peroxidation product.

Conclusion & Significance: M. alba leaf extract is the potential herbal therapy against autism but clinical trial study is essential to confirm this positive modulation effect.

Biography

Jurairat Klongrum has received PhD in Neuroscience at Khon Kaen University, Thailand.

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