The Protective Effects of Vitamin E and Zinc Supplementation Against Lithium-Induced Brain Toxicity of Male Albino Rats

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Abstract:

Lithium (Li) therapy has widely used in the treatment of bipolar disorder. Consequently, consciousness of the side effects and pathogenesis of this metal is needed for such treatments. Recently, information on the interaction of Li with oxidative markers and organs toxicity attend the researchers over the world. In the present study we have tried to evaluate the influence of oral administration of LiCl for 4 weeks on the oxidative stress marker and histological structure of brain in male rats. Fifty adult male albino rats weighing 135±15 gm was categorized into 5 groups (10 rats each). Group I worked as negative control, group II administrated with LiCl (0.20 mg/kg bw) in drinking water, group III, IV and V were administrated with Zn (10 mg/kg bw), VE (100 mg/kg bw) and their combination twice a week besides the daily administration of LiCl for 4 weeks, respectively. Rats after anesthesia with ether killed for collocation of brain for histopathological and biochemical analysis. Data obtained showed a significant increase in LPO, NO, GSH and Li content and the activities of SOD, CAT and AChE with demyelination of the nerve fibers and degeneration of neurons in brain of LiCl treated rats. Co-treatment of rats with Zn or VE results in a significant decrease in LPO, NO, GSH content in the activities of SOD, CAT and AChE with less or normal structure of the brain. However, co-treatment with combination of Zn and VE caused a significant increase in SOD, CAT and AChE activities with normal histological structure. In conclusion, the data from the present study show that Zn and VE and their interaction are effective in protection against Li-induced brain toxicity in rat with priority for the combination.

Keywords:

Lithium, vitamin E, brain, rats, oxidative stress, acetylcholinesterase (AChE)

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