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Original Article

Ameliorative effects of ascorbic acid on mercury-induced learning and memory impairment in rats

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ABSTRACT

Mercury is a hazardous heavy metal and the nervous system has been shown to be the main target. The present work was aimed at evaluating the effects of ascorbic acid on mercury exposure on spatial learning and memory of adult Wistar rats. Twenty five adult Wistar rats (average weight 185 g) were randomly divided into five groups of five rats per group; control group administered normal saline, mercuric chloride (HgCl2; 49.8 mg/kg), HgCl2 with distilled water, HgCl2 with low dose vitamin C (595 mg/kg) and HgCl2 with high dose vitamin C (1,190 mg/kg). The animals were each orally administered daily for three weeks. Morris water maze test was carried out to test for spatial learning and memory. The results from Morris water maze test showed significant increase ($p<0.05$) in mean time taken by the animals to locate the hidden platform in mercury treated groups compared to animals in the control and ascorbic acid treated groups, suggestive of neurological toxicity of mercury to learning and memory loss. Histological result showed distortion of CA3 region cells of the hippocampus and vacuolation of cells were observed in all other groups compared to the control. Therefore, ascorbic acid seems to ameliorate memory deficit in the hippocampus caused by mercury exposure in adult Wistar rats.

Keywords: Mercuric Chloride, Hippocampus, Memory, Ascorbic acid, Adult Wistar rats