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J Neurol Disord 2018, Volume 6
DOI: 10.4172/2329-6895-C7-044

Protective role of oleanolic acid against aluminium chloride induced neurotoxicity and histo-pathological abnormalities in rat's brain

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Aluminium, a neurotoxic agent, has widely implicated in the pathogenesis of many neurodegenerative disorders. In this study, we examined the aluminium toxicity with special emphasis to behavioral and biochemical effects of memory centers mainly present in hippocampus and cortex. Further, we examined the effect of oleanolic acid treatment at 6 and 12 mg/kg b.w on aluminium intoxication rats. Animals were treated orally with aluminium chloride ($AlCl_3$; 175 mg/kg b.w) for a period of 45 days that changes its behavior which was assessed using Morris water maze test and Y-maze test. Followed by behavior parameters animals were sacrificed to remove hippocampus and cortex from the brain for biochemical investigations (AchE activity, antioxidant assays using GSH, GPx, SOD, Catalase and nitrite levels). Our findings suggest that treatment with oleanolic acid shows greater improvement in cognitive function and significantly elevated the reduced anti-oxidant levels in hippocampus and frontal cortex. Oleanolic acid at 12 mg/kg exhibited superior improvement in cognitive function which was comparable with that of the standard drug Rivastigmine. From the results, the present study suggests that treatment with oleanolic acid protects the neurons in hippocampus and frontal cortex from aluminium chloride induced toxicity in rats.

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