

# NEUROPROTECTIVE EFFECT OF EMBLICA OFFICINALIS LEAVES EXTRACT AGAINST ALZHEIMER'S DISEASE INDUCED IN ANIMAL MODEL

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## Abstract

In traditional Indian medicine, all parts of *Emblica officinalis* Gaertn plant including the fruit, seed, leaves, root, bark and flowers are used in various herbal preparations for the treatment of diabetes mellitus, chronic diarrhoea, anti-inflammatory and antipyretic. Neuroprotective effect of *Emblica officinalis* leaves extract against Alzheimer's disease induced in animal model. The experiment was designed for 21 days and either sex Wistar rats were divided into 5 groups (n=6). Group 1 served as normal control (treated with normal saline 2ml/kg), Group 2 Served as negative control group (treated with AlCl<sub>3</sub> 100mg/kg p.o.), Group 3 Was treated with AlCl<sub>3</sub> 100mg/kg p.o. + Hydro-methanolic *Emblica officinalis* leaves extract 100mg/kg p.o., Group 4 treated with AlCl<sub>3</sub> 100mg/kg p.o. + Hydro-methanolic *Emblica officinalis* leaves extract 200mg/kg p.o., Group 5 received Rivastigmine 1.5mg/kg p.o. respectively. The neuroprotective effect was measured by behavioral and biochemical parameters, for behavioral parameters, Morris water maze test, elevated plus maze test, Rotarod test, Pole climbing test, Locomotor tests were done. At the end of all experiment rats were sacrificed and brains were dissected and prepared homogenate for determination of behavioral parameters, acetylcholinesterase (AChE) levels and oxidative stress was measured in brain by level of antioxidant markers i.e., superoxide dismutase (SOD), reduced glutathione (GSH), and catalase (CAT) and histopathologic examination. This study indicated that AlCl<sub>3</sub> induced AD rats shows reduction in behavior and in biochemical, increase AChE levels, decrease oxidative stress. While rats treated with Rivastigmine and *Emblica officinalis* in protective and therapeutic groups exhibited significant improvement in behavior, significant increase in brain ACh and decrease AChE levels, increase oxidative stress. The results suggest that the hydro methanolic extract of leaves of *Emblica officinalis* treated group may effectively normalize the impaired antioxidant status in AlCl<sub>3</sub> induced Alzheimer's disease.