

Neuroprotective Activity of Ipomoea cairica Leaf Extract against Cadmium Chloride-Induced Biochemical Changes in the Brain of Male Wistar Rats

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Abstract:

Background: Exposure to cadmium is implicated in the etiology of some neurodegenerative diseases. Compounds isolated from *Ipomoea cairica* extract are neuroprotective. However, there is no reported neuroprotective activity of the crude extract of *I. cairica* (ICE). We investigated the neuroprotective activity of *I. cairica* extract against cadmium-induced biochemical changes in the brain of male Wistar rats. Thirty-six animals were divided into four groups of 9 animals per group: group I (Control); group II (3.5 mg/kg CdCl₂); group III (100 mg/kg ICE+ CdCl₂); and group IV (250 mg/kg ICE+ CdCl₂). Animals were pretreated with 100 and 250 mg/kg ICE before co-administration with cadmium chloride.

Results: CdCl₂ treatment caused a significant increase in acetylcholinesterase activity, lipid peroxidation, beta-amyloid aggregation, caspase 3 and 9, p53, and glutamate concentration. In addition, CdCl₂ caused a significant decrease in catalase activity, superoxide dismutase, glutathione-S-transferase, Na⁺/K⁺ ATPase, and glutamate dehydrogenase. ICE was able to reduce the neuronal damaging effect of CdCl₂ by acting as an antioxidant, antiapoptotic, anticholinesterase, and antiexcitotoxicity.

Conclusions: Our findings show that *Ipomoea cairica* leaf can be developed and included in the natural product in the prevention of neurodegenerative diseases.

Keywords: Cadmium, Neurotoxicity, Natural product, Oxidative stress, Beta-amyloid, Glutamate, *Ipomoea cairica*