

Neuroprotective Effect of Chia Seeds Extract on Aluminum Chloride Induced Alzheimer's Rat Model

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Alzheimer's disease (AD) is the most common form of dementia, associated with irreversible neuropathological and neurobehavioral changes accompanied by memory and cognitive impairments. Despite the overwhelming evidence that links oxidative stress and AD, antioxidant therapies have limited success in clinical trials. The present study was aimed to evaluate the protective effect of Chia seeds extract on aluminum chloride (AlCl_3) induced rat model. Oral administration of AlCl_3 (200 mg/kg) for 60 days significantly elevated the levels of aluminum (Al), activity of acetylcholinesterase (AChE) and protein expressions of amyloid precursor protein (APP) compared to control group in hippocampus and cortex of rat brain. Chia seeds extract was administrated orally along with AlCl_3 for 60 days (day after day protocol), significantly revert the Al concentration, AChE activity and Ab synthesis-related molecules in the studied brain regions. Our results showed that the behavioral impairments caused by aluminum were significantly attenuated by Chia seeds extract. As the spontaneous locomotor and exploratory activities in open field test were significantly reduced and the learning and memory impairments in Novel Object Recognition (NOR) test were enhanced. The histopathological studies in the hippocampus and cortex of rat brain also supported that Chia seeds extract markedly reduced the toxicity of AlCl_3 and preserved the normal histoarchitecture pattern of the hippocampus and cortex. From these results, it is concluded that Chia seeds can reverse memory loss caused by aluminum intoxication through attenuating AChE activity and amyloidogenic pathway.

Biography:

Eman H. Abdelnaby is an Ethologist who has graduated from Cairo University, Egypt. She has earned her Master's in Animal Behavior. She is currently enrolled in her PhD in Alzheimer's Disease (AD), her study is about developing new herbal approaches (natural antioxidants) in AD Rat model. She was a professional fellow that visited several academic institutions as a scholar, including MBNI and ULAM-Michigan University, MSU- USA. Also joined an AD scientific project as an Erasmus+ student at Alexandru Ioan Cuza University, Romania. She has more than 7 years of research and teaching experience as an assistant lecturer and academic advisor. She is also a Certified Life Coach, a Certified Professional Trainer accredited from Missouri State University and a member of the "Board of International Trainers", and currently acting as a Mentor at MENA-Michigan Initiative for Global Action through Entrepreneurship (M2GATE) program.