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Isorhynchophylline improves learning and memory impairments induced by aluminum chloride in mice

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Isorhynchophylline (IRN), an alkaloid isolated from *Uncaria rhynchophylla*, has been reported to improve cognitive impairment induced by beta-amyloid in rats. However, whether IRN could also ameliorate the aluminum chloride (AlCl₃)-induced mouse memory deficits is still not clear. In the present study, we aimed to investigate whether IRN had potential protective effect against the AlCl₃-induced cognitive deficits in mice. Mice were given a subcutaneous injection of AlCl₃ (50 mg/kg) and orally administered IRN (20 or 40 mg/kg) daily for 8 weeks, followed by assessing spatial learning and memory function by the Radial Arm Maze test. The results showed that IRN significantly improved spatial learning and memory function in the AlCl₃-treated mice. In the mechanistic studies, IRN significantly increased the level of glutathione (GSH) and the activities of superoxide dismutase (SOD) and catalase (CAT), while decreased the level of malondialdehyde (MDA) in the brain tissues of the AlCl₃-treated mice. Moreover, IRN (40 mg/kg) significantly inhibited/decreased the acetylcholinesterase activity, as well as the activation of nuclear factor kappa B (NF-κB) in the brain tissues of AlCl₃-treated mice. These results indicate that IRN was able to ameliorate cognitive deficits induced by AlCl₃ in mice, and the observed actions may be mediated, at least in part, by the inhibition of acetylcholinesterase activity and the enhancement of the antioxidant status of brain tissue.

Biography

Lin Zhi-Xiu is the Acting Director and Associate Professor of School of Chinese Medicine, The Chinese University of Hong Kong. He obtained his PhD degree in Pharmacognosy from King's College London in 1999. He has rich experience in studying the neuroprotective effects of Chinese medicines and natural products. Over the years, he has published over 150 research articles on Chinese medicines and natural products, among them, over 110 articles are in the SCI-cited journals. This study aimed to investigate the neuroprotective effect of isorhynchophylline (IRN) in aluminum chloride (AlCl₃)-treated mice and explore the molecular mechanisms in the brain of mice. The results showed that IRN treatment could improve the cognitive deficits and reverse the biochemical changes induced by AlCl₃. The results from the present proposed study would form a solid stepping stone leading to future clinical trial of IRN on Alzheimer's disease.

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