

Neuroprotective Effects of Rosmarinic Acid in the MPTP Mouse Model of Parkinson's Disease

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Abstract : Rosmarinic acid (RA) is a natural acid that is found in a variety of herbs, such as rosemary and has multiple biological activities such as antioxidative, anti-inflammatory and antiviral activities. In this study, we investigated the neuroprotective effects of RA on dopaminergic system in 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) induced mouse model of Parkinson's disease (PD). The mice received oral administration of RA before MPTP injection. Results showed that the tyrosine hydroxylase expression in SN reduced and the levels of dopamine and its metabolites in the striatum decreased in MPTP intoxicated PD mice. Pretreatment with RA significantly inhibited these changes. Further studies demonstrated that MPTP treatment increased the iron content, which was counteracted by pre-treatment with RA. In addition, RA could restore the decrease of superoxide dismutase (SOD) induced by MPTP. This study provides evidence that RA could suppress MPTP-induced degeneration of the nigrostriatal dopaminergic system by regulating iron content and the expression of SOD. Thus, RA might be clinically evaluated for the prevention of neurodegenerative diseases.

Keywords : rosmarinic acid, Parkinson's disease, MPTP, dopaminergic system

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