

Pistachio Supplementation Ameliorates the Motor and Cognitive Deficits in Rotenone-Induced Rat Model of Parkinson's Disease

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Abstract : Parkinson's disease (PD) is a common neurological disorder characterized by motor deficits and loss of dopaminergic neurons. Oxidative stress is said to play a pivotal role in the pathophysiology of the disease. In the present study, PD was induced by injection of rotenone (1.5 mg/kg/day, s.c.) for eight days. Pistachio (800 mg/kg/day, p.o.) was given for two weeks. At the end of treatment brains were dissected out and striatum was isolated for biochemical and neurochemical analysis. Morris water maze (MWM) test and novel object recognition (NOR) task was used to test the memory function while motor behavior was determined by open field test (OFT), Kondziela inverted screen test (KIST), pole test (PT), beam walking test (BWT), inclined plane test (IPT) and footprint (FP) test. Several dietary components have been evaluated as potential therapeutic compounds in many neurodegenerative diseases. Increasing evidence shows that nuts have protective effects against various diseases by improving the oxidative status and reducing lipid peroxidation. Pistachio is the only nut that contains anthocyanin, a potent antioxidant having neuroprotective properties. Results showed that pistachio supplementation significantly restored the rotenone-induced motor deficits and improved the memory performance. Moreover, rats treated with pistachio also exhibited enhanced oxidative status and increased dopamine (DA) and 5-hydroxytryptamine (5-HT) concentration in striatum. In conclusion, to our best knowledge, we have for the first time shown that pistachio nut possesses neuroprotective effects against rotenone-induced motor and cognitive deficits. These beneficial effects of pistachio may be attributed to its high content of natural antioxidant and phenolic compounds. Hence, consumption of pistachio regularly as part of a daily diet can be beneficial in the prevention and treatment of PD.

Keywords : rotenone, pistachio, oxidative stress, Parkinson's disease

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