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CELL-DEATH MECHANISMS OF MPTP-INDUCED PARKINSONISM

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The cause of Parkinson's disease (PD) is largely unknown. However, free radical toxicity may play a role in the degeneration of substantia nigra, which is the major focus of pathological damages in PD. Recently, a neuroprotective effect of nicotine in PD has been suggested. Therefore, the mechanism of neurodegeneration and protective potential of nicotine in PD were investigated in the experimental model of PD using a neurotoxin. C57BL/6 mice were administered with 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP, 30 mg/kg, i.p.). The degree of neurodegeneration was determined by immunohistochemical staining of tyrosine hydroxylase (TH). TH-positive cells on nigral sections were found 56.0±4, 57.9±6, 52.3±5cells, 49.0±3cells, and 39.4 ±5cells at days 1, 2, 3, 4, 5, respectively (controls : 57.6±5cells). Hoechst and TUNEL staining showed no evidence of apoptosis. The examination on the mice co-administered with nicotine(0.2mg/kg) and MPTP(30mg/kg) revealed a tendency of nicotine protective effects. At days 4 and 5, the degree of TH-positive cells was decreased by 20-30%. In conclusion, the role of apoptosis was not evidenced in this MPTP mouse model of PD. The possible protection by nicotine should be elucidated with further studies.