

Original Paper

Comparison of the intranasal and intraperitoneal injection of MPTP on density of dark neurons in pars compacta of substantia nigra in animal model of Parkinson's disease

Shahi S (B.Sc)¹, Ebrahimi Vosta Kalae S (Ph.D)², Hami J (Ph.D)³
Hosseini M (B.Sc)⁴, Lotfi N (B.Sc)⁵, Afshar M (Ph.D)*⁶

¹M.Sc Student of Animal Sciences, Payame Noor University, Tehran, Iran. ²Assistant Professor, Department of Biology, Faculty of Sciences, Payame Noor University, Iran. ³Assistant Professor, Department of Anatomy, Faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran. ⁴B.Sc in Public Health, Research Center of Experimental Medicine, Birjand University of Medical Sciences, Birjand, Iran. ⁵M.Sc Student of Anatomy, Department of Anatomy, Faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran. ⁶Professor, Department of Anatomy, Faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran.

Abstract

Background and Objective: Parkinson disease (PD) is the second most common neurologic disorder that results following degeneration of dopaminergic neurons in the pars compacta of substantia nigra (SNc). The 1-methyl-1,2,3,6-tetrahydropyridine (MPTP) is a chemical neurotoxin that widely used in animal models of PD. This study was carried out to evaluate the numerical density of dark neurons (DNs) in the SNc in mice subjected to intraperitoneal and intranasal injection of different doses of MPTP.

Methods: In this experimental study, 90 male adult BALB/c mice were randomly allocated into four experimental groups including: group 1 (MPTP was injected via i.p. at the dose of 20mg/kg per 2 hours for 4 times), group 2 (MPTP was injected via i.p. at the dose of 30mg/kg for 5 consecutive days), group 3 (MPTP was injected via i.n. at a single dose of 1mg/kg), group 4 (MPTP was injected via i.n. at a single dose of 1mg/kg), four sham and one normal groups. 20 days after the final injection, the animal's brain were removed and stained by toluidine blue. Numerical density of DN was counted.

Results: Intranasal injection of MPTP significantly increased density of dark neurons in the pars compacta of substantia nigra in compare to intraperitoneally injection of MPTP ($P < 0.05$).

Conclusion: Intranasal injection of MPTP is more effective manner to induce degeneration of neurons in substantia nigra in animal model of Parkinson's disease.

Keywords: Parkinson disease, MPTP, Dark neuron, Substantia Nigra, Intraperitoneal injection, Intranasal injection

* **Corresponding Author:** Afshar M (Ph.D), E-mail: afshar_md@yahoo.com

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