Involvement of nitric oxide in the nigrostriatal dopaminergic system degeneration: a study on the 6-OHDA model of Parkinson's disease.

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Aim: The present study was undertaken to explore the involvement of nitric oxide (NO) in the 6-hydroxydopamine (6-OHDA) experimental model of Parkinson's disease in rats. The effect of pharmacological manipulation of NO system was evaluated on striatal dopamine (DA) levels decrease produced by the toxin compare with the right levels.
Methods: Experiments were carried out on Sprague- Dawley rats. In the *control-lesioned* group (n = 7), 6-OHDA (5µg) was infused in the left substantia nigra pars compacta (SNc). A second lesioned group (n = 7), 50 mg/kg i.p. of the NO synthase (NOS) inhibitor, 7-nitroindazole (7-NI), was administrated 1 h before the toxin infusion. A third lesioned group, 40 mg/kg i.p. of molsidomine (MOL), a NO donor, was injected 1 h before the toxin. In a fourth group (n = 7), 7-NI and MOL were co-injected 1 h before the toxin. Four sham groups (n = 7, each) received similar pharmacological treatment, nil, 7-NI, MOL, 7-NI+MOL. After a week from the lesion, rats were sacrificed and their brains removed and the striatum of both sides was collected. The samples were analyzed by reversed-phase HPLC with electrochemical detection.
Results: The levels of DA in the left striata were -90.6 ± 9.5% in the *control-lesioned* animals, -35.3 ± 4.4% in the 7-NI group, -91.5 ± 6.4% in the MOL group and -88 ± 5.1% in the 7-NI+MOL group. In the shame groups 7-NI and MOL did not affected DA striatal levels.
Conclusion: 7-NI significantly restored the striatal DA levels in 6-OHDA treated rats. The protective effect was lost when NO levels were augmented by co-treatment with MOL. Thus a possible role of NO in 6-OHDA induced neurodegeneration is suggested as well of a protective benefit for inhibitors of NOS in the treatment of Parkinson disease.