

Thesis Title Apomorphine-induced rotation in the substantia nigra lesioned rat : relationship to changes in biogenic amine receptors.

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#### ABSTRACT

The relationship between the destruction of dopamine (DA) containing neurons, specific binding of [<sup>3</sup>H]-spiperone ([<sup>3</sup>H]-SP), [<sup>3</sup>H]-quinuclidinyl benzilate ([<sup>3</sup>H]-QNB) and ipsilateral rotation in response to apomorphine (1 mg/kg, IP) was studied in rats with unilateral electrolytic lesions (2 mA DC, 15 sec) of the substantia nigra. The lesioned animals with rotational behavior in response to apomorphine were classified into 3 groups according to the number of total turns. The [<sup>3</sup>H]-SP binding and [<sup>3</sup>H]-QNB binding to striatal membrane were carried out in both lesioned and nonlesioned side. It has been shown that in rats, group I (number of turns < 10), group II (number of turns between 80-150) and group III (number of turns > 300), there are no significant different in the equilibrium dissociation con-

stant values ( $K_d$ ) between the lesioned and nonlesioned side. However, the significant differences of the maximal receptor density ( $B_{max}$ ) of both [ $^3H$ ] -SP binding and [ $^3H$ ]-QNB binding between the two striatal sides were observed in group III animals. The  $B_{max}$  after [ $^3H$ ]-SP binding in the lesioned side is  $357 \pm 103$  fmol/mg protein and in the nonlesioned side is  $759 \pm 119$  fmol/mg protein, whereas in [ $^3H$ ]-QNB binding the  $B_{max}$  in the lesioned side is  $460.14 \pm 26.56$  fmol/mg protein and in the nonlesioned side is  $371.71 \pm 16.9$  fmol/mg protein.

The results of the present study show that the number of dopamine receptor binding sites and muscarinic receptor binding sites are altered in the striatum of the rats with significant rotational behavior in response to apomorphine. Furthermore, the number of dopaminergic binding sites decrease, while the number of muscarinic receptor binding sites increase which indicates the reciprocal relationship between the function of dopaminergic and cholinergic systems in the striatum.