

Thesis Title EFFECTS OF CHOLINOTOXIN ON ROTATIONAL
 MOVEMENT IN RATS

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Date of Graduation 25 May, B.E. 2533 (1990)

ABSTRACT

Ethylcholine aziridinium solution (AF64A) a putative specific cholinergic neurotoxin, was unilaterally injected into striatum of male rats in the dose range of 0.01-8 nmol. Only 0.8-8 nmol of AF64A-injected rats challenged with apomorphine exhibited ipsilateral circling behavior in a dose-dependent manner. A time course study of the effect of 8 nmol of AF64A on apomorphine induced rotation for a period of up to 29 days revealed that these rats exhibited a gradually decreased response to apomorphine as illustrated by the number of total turn were 216.5 ± 11.65 , 161.17 ± 12.02 , 105.83 ± 6.01 , 61.67 ± 16.35 and 43 ± 15.52 after 4, 8, 15, 22 and 29 days of AF64A injection respectively. Similar results were observed in rats treated with 0.8, 1 and 4 nmol. Scatchard analyses of binding studies with [^3H] quinuclidinyl benzilate were also performed to assess changes in the muscarinic receptor population in the

striatum with 8 nmol AF64A. This study demonstrated that there are no significant differences in the equilibrium dissociation constant values (K_d) between the lesioned and nonlesioned sides while there are significant differences of the maximum density (B_{max}) of [3H]-QNB binding between the two striatal sides. The B_{max} values were decreased to $62.58 \pm 4.76\%$, $80.15 \pm 3.22\%$ and $91.12 \pm 3.70\%$ in the lesioned sides when compared to the nonlesioned side at 4, 15, 29 days after injection, respectively.

The results of the present study showed that the number of muscarinic receptors in the striatum and the total numbers of rotation of the rats induced by apomorphine depend on the doses and the time course of AF64A injection. Furthermore, it may also be possible to indicate the relationship between the function of striatal cholinergic system and the rotational behavior. Since, the higher the dose of AF64A injected, the greater the numbers of rotation occurred.