SHORT COMMUNICATION

MONOAMINE OXIDASE CONCENTRATION IN MEDIAN EMINENCE, PITUITARY AND UTERUS OF RAT AFTER ESTROGEN AND CENTCHROMAN TREATMENT

KARTAR SRIVASTAVA AND PRANAB K. DASGUPTA

Division of Endocrinology,
Central Drug Research Institute, Lucknow - 226 001

(Received on June 11, 1980)

Summary: Estradiol dipropionate (0.005 mg/kg) increased the monoamine oxidase levels in pituitary, median eminence and uterus of ovariectomized rats. Centchroman (3,4-trans-2, 2-dimethyl-3-phenyl-4-p-(pyrrolidinethoxy)-phenyl-7 methoxy chroman, 1.25 mg/kg) decreased the enzyme levels in pituitary and median eminence but not in uterus. Centchroman, given to estradiol treated groups could not bring down the enhanced levels of the enzyme in the uterus.

Key words: monoamine oxidase Centchroman Estradiol pituitary median eminence uterus

INTRODUCTION

Monoamine oxidase (MAO) enzyme is believed to be involved in intracellular oxidative deamination of biogenic amines at hypothalamo-hypophyseal tract and plays an important role in the inhibitory stimulation of LHRH at the median eminence portion of the hypothalamus (2, 5). Estrogens and progesteron are known to exert an action at the level of pituitary and hypothalamus, through 5-hydroxytryptamine neurons (4, 6, 7).

In the present study an attempt has been made to compare the effects of 3, 4-trans-2, 2-dimethyl-3-phenyl-4-p-(pyrrolidinethoxy)-phenyl-7 methoxychroman (Centchroman), a nonsteroidal antifertility drug developed by this Institute and estradiol on the MAO levels of pituitary, median eminence and uterus.

MATERIALS AND METHODS

Adult female albino rats (120–150 g) maintained under uniform husbandary conditions and temperature (23±1°C) were ovariectomized. A post operative 10 days dispuse was given to all the ovariectomized animals. The animals were divided in to four groups of 10 animals each as indicated in Table I. Estradiol dipropionate (0.005 mg/kg) dissolved
in olive oil was injected subcutaneously while Centchroman (2.5 mg/kg) dissolved in physiological saline was administered i.p. Autopsy was done 48 hr after single administration. Pituitary, median eminence and uterus were immediately dissected out under a dissection microscope with the help of a fine razor, weighed and processed for estimation of MAO according to the method of Krajl (3) using kynuramine dihydrobromide as substrate.

RESULTS AND DISCUSSION

The administration of Centchroman produced an increase in MAO activity in the uterus (P<0.01), and a slight to significant decrease in the activity in the pituitary and median eminence when compared to the sham ovariectomized control. On the contrary administration of EDP increased the MAO activity in the pituitary, median eminence and uterus (P<0.01). However, Centchroman, when administered alongwith EDP lowered the MAO activity in the pituitary and median eminence but not in uterus.

The results presented in Table I indicate that EDP produced marked to moderate increase in the MAO levels of pituitary and median eminence. It seems, that the turnover rate of catecholamine in the medial palisade zone of the hypothalamus is considerably high. A similar observation has been made by Fuxe et al. (1) after EDP treatment.

<table>
<thead>
<tr>
<th>TABLE I: Monoamine oxidase activity in pituitary, median eminence and uterus of ovariectomized female rat.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
</tr>
<tr>
<td>i Control (10)*</td>
</tr>
<tr>
<td>ii Centchroman (10)*</td>
</tr>
<tr>
<td>iii Estradiol dipropionate (EDP) (10)*</td>
</tr>
<tr>
<td>iv Centchroman + Estradiol dipropionate (EDP) (10)*</td>
</tr>
</tbody>
</table>

The results are expressed in terms of 4-hydroxyquinoline content in/μM per 30 min ± S.E.M. *Number of animals.

Centchroman per se as well as in combination with EDP lowered the MAO activity in the pituitary and median eminence as found earlier (8).

According to Fuxe et al. (1), unlike luteinizing hormone and prolactin, the synthesis and release of follicular stimulating hormone (FSH) is not under the control of central
dopamine and noradrenaline pathways and as such high levels of MAO in the uterus may be due to stimulatory action of FSH and non-utilization of catecholamines at local uterine level (Srivastava et al, unpublished data). However, under the present dose level Centchroman induced a stimulatory effect on MAO levels on the uterus.

REFERENCES


