

SHORT COMMUNICATION

EPHEDRINE MODIFIES HYPOTHERMIA OF CLONIDINE
AND CHLORPROMAZINE

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Summary : Ephedrine (5 mg/kg, im) did not alter the body temperature of rats, while clonidine (20 µg/kg, im) and chlorpromazine (10 mg/kg, im) caused hypothermic effect. Ephedrine pretreatment augmented the clonidine hypothermia but antagonized the chlorpromazine hypothermia.

Key words : ephedrine

clonidine

chlorpromazine

hypothermia

INTRODUCTION

Catecholamines cause hypothermia in rats and mice by activating α -adrenergic mechanism of the hypothalamus (1). Ephedrine, a sympathomimetic drug, activates central and peripheral alpha-adrenoreceptor mechanisms (6). Clonidine evokes hypothermic effect by its central post-synaptic alpha-adrenoreceptor excitatory action (4,5). Though chlorpromazine acts as an alpha-adrenoreceptor blocker, it evokes hypothermia (3). In view of this the present work was carried out to study the modification of the hypothermic effect of clonidine and chlorpromazine, caused by ephedrine.

MATERIALS AND METHOD

Male albino rats of mixed strain, weighing from 110-150 g. were used. The study was carried out at ambient room temperature (16°C). The animals were divided into 6 groups of 4 animals each. Rectal temperature was monitored with a thermometer before and then every 30 min after intramuscular administration of the solvent (pyrogen

free distilled water) or the salts of drugs. The groups of the animals were treated as follows - the group 1 (control group) only solvent; group 2, ephedrine sulphate (5 mg/kg); group 3, clonidine hydrochloride (20 µg/kg); group 4, chlorpromazine hydrochloride (10 mg/kg); group 5, ephedrine sulphate (5 mg/kg) followed by clonidine hydrochloride (20 µg/kg) and group 6, ephedrine sulphate (5 mg/kg) followed by chlorpromazine hydrochloride (10 mg/kg)

RESULTS

Ephedrine did not significantly alter the body temperature (Fig. 1). Clonidine evoked a maximal hypothermia of 2.8°C in 30 min; the temperature returned to normal in 90-120 min. Chlorpromazine evoked a maximal hypothermia of 8°C in an hr which disappeared more slowly. Ephedrine-pretreatment significantly augmented clonidine-

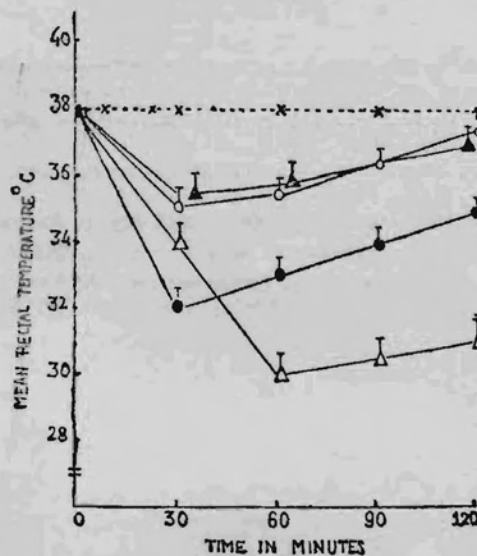


Fig. 1 : Hypothermic effect of clonidine and chlorpromazine with or without im ephedrine pretreatment in male albino rats.

Pyrogen free (0.5 ml) distilled water or ephedrine 5 mg/kg (X), clonidine 20 µg/kg (O), chlorpromazine 10 mg/kg (Δ), ephedrine 5 mg/kg followed by clonidine 20 µg/kg (●) and ephedrine 5 mg/kg followed by chlorpromazine 10 mg/kg (▲): All injected im at (□). Vertical lines represent Standard Error.

hypothermia ($P < 0.01$) but significantly antagonized chlorpromazine-hypothermia ($P < 0.01$), (Fig. 1).

DISCUSSION

Clonidine causes hypothermia by activating postsynaptic alpha-adrenoceptor mechanism of anterior hypothalamus (1,5,6). However, presynaptic site of its hypothermic action is also suspected (5). In conformity with this, we observed that ephedrine a sympathomimetic drug, significantly augmented the hypothermic response of clonidine probably by facilitating the central presynaptic or postsynaptic action of this drug. Chlorpromazine caused hypothermia (2,3) though it is an alpha - adrenoceptor blocker. We found that ephedrine significantly antagonized chlorpromazine induced hypothermia. Explanation of this antagonism is not easily available.

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