EFFECT OF 3',5'-DIMETHYLPYRAZOLE ON COLONIC TEMPERATURE, PLASMA GLUCOSE, NEFA AND CORTICOSTERONE IN THE NON-ACCLIMATED RATS SUBJECTED TO COLD

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The increase in urinary catecholamine was observed in the animals subjected to cold (1, 2). Norepinephrine and epinephrine released from sympathetic nervous system and adrenal glands produced to increase plasma glucose and NEFA as fuels. The blockade of catecholamine action and the depletion of tissue catecholamine led to death during cold-exposure (3). Our previous experiments showed that in the course of prolonged cold-exposure the initial increase in plasma glucose gradually returned to the control level. On the contrary, the increased plasma NEFA was observed to be maintained during cold-exposure. This seemed to indicate that plasma NEFA is a favorable fuel for maintaining the body temperature in prolonged cold-exposure (4).

The present experiment was designed to know the changes in colonic temperature, plasma glucose, NEFA and corticosterone in the cold-stressed rats when the hormone sensitive lipase activity was inhibited by 3', 5'-dimethylpyrazole (DMP) and plasma NEFA decreased.

Male rats of Wistar strain weighing 200-220 g were used. One hour before cold-exposure, animals were intraperitoneally injected with 20 mg/kg of DMP and subjected to cold of -8°C for 1.5 hours in a cold room. After cold-exposure animals were decapitated and their blood collected into polyethylene tubes. The collected blood was centrifuged and the obtained plasma was served for the determinations of glucose by the glucose oxidase method, NEFA by the method of Dole (5) and corticosterone by the method of Guillemin et al. (6). Colonic temperature was measured with a clinical thermometer. Statistical analysis of data was done according to the student t-test. Significant differences were given at the level of 5% or less than 5%.

The results were shown in Table 1. DMP gave no effects on colonic temperature, plasma glucose and NEFA in the intact rats except the significant increase in plasma corticosterone. The increase in plasma NEFA by cold-exposure was significantly inhibited in the DMP treated rats compared to the control group. On the contrary, the significant increase in plasma glucose was found in the DMP treated rats with cold-exposure. The increase in plasma corticosterone was small in the DMP treated plus cold-stressed rats and the corticosterone level was about the same in both the intact and DMP treated animals subjected to cold.
Each value is the mean±S.E. of five to six animals.
*: Significant difference: Control group (1→2) vs Experimental group (3→4)

After cold-exposure, the significant fall in colonic temperature was observed in both the intact and DMP treated rats, but there was no significant difference between them. These findings suggested that in acute cold-exposure both plasma glucose and NEFA were needed for maintaining the body temperature and therefore the significant compensatory increase in plasma glucose occurred as a consequence of the significant decrease in plasma NEFA in the DMP treated rats.

REFERENCES


THE ACUTE PARTIAL FAILURE OF NEUROMUSCULAR TRANSMISSION BY RESERPINE IN THE ISOLATED PERFUSED RABBIT'S HEART

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It has been well established that the application of reserpine in vivo leads to a prolonged decrease in endogenous noradrenaline (NA) content and reduces the responses of various kinds of sympathetically innervated organs to the nerve stimulation. However, there are few available reports about the action of reserpine in acute phase. In the present experiment, it was investigated in the isolated perfused rabbit's heart.

Langendorff's preparations with bilateral stellate ganglia were perfused with Krebs bicarbonate solution (sodium (Na) 143 mm) as described previously (1). Procedures of the electrical nerve stimulation and perfusion of reserpine (Serpasil® CIBA) solution (10⁻⁶ g/ml) are explained in Fig. 1. About one-third of the preparations was suspended by means of the perfusion apparatus (Natsume KN-206) for recording isotonic changes in spontaneous contractile responses to the nerve stimulation or exogenously a-

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