

# CHANGES IN CARDIO-INHIBITORY EFFECT OF VAGAL STIMULATION IN EXPERIMENTAL DISTURBANCE OF ADRENAL FUNCTION

É. N. Berger and V. A. Bolyarskaya

UDC 616.45-008.6-092.9-07:612.178.1-072.7

Recovery of the heart rate during stimulation of the peripheral end of the vagus nerve in adrenalectomized rats took place much faster than in controls. If the experimental animals were given desoxycorticosterone acetate, the changes in the response of the heart during vagal stimulation approximated to those observed in control rats.

\* \* \*

The results of our previous investigations showed that adrenalectomy in rats causes changes in the reaction of the heart to intravenous injection of acetylcholine. This phenomenon is expressed as a shortening of the period of cardio-inhibitory action of acetylcholine. It was prevented by administration of desoxycorticosterone to the adrenalectomized animals [1].

The object of the present investigation was to discover whether changes in the cardiac reaction to endogenous acetylcholine liberated during stimulation of the vagus nerve can be detected in adrenalectomized animals.

## EXPERIMENTAL METHOD AND RESULTS

Experiments were carried out on albino rats of both sexes weighing 110-160 g. After fixation of the animal, the right vagus nerve was exposed and divided in the neck. Its peripheral end was placed on electrodes. The nerve was stimulated with a faradic current for 1 min, the voltage in the primary circuit being 5 V and the distance between coils 10 cm. The cardiac activity was recorded electrocardiographically. During vagal stimulation a marked bradycardia first developed, after which the heart rate gradually increased, although it remained below the initial value until the end of stimulation. The heart rate was determined before stimulation and every 5 sec during stimulation. The

rates were expressed as percentages of the initial heart rate. Experiments were carried out on three groups of animals: group 1 consisted of 20 control rats, group 2 of 22 adrenalectomized rats, and group 3 of 20 adrenalectomized rats receiving desoxycorticosterone acetate subcutaneously in a daily dose of 250 µg. The experiments on both groups of adrenalectomized animals were carried out 9-18 days after adrenalectomy.

The heart rate was restored more rapidly during stimulation of the vagus nerve in the adrenalectomized animals than in the controls (Fig. 1). The mean heart rates, expressed as a percentage of the initial rate, was much higher 1 min after the beginning of stimulation in the adrenalectomized animals than in the controls ( $P < 0.001$ ). Compared with these animals, in the adrenalectomized rats receiving DOCA the heart rate was restored more slowly—at approximately the time observed in the control animals.

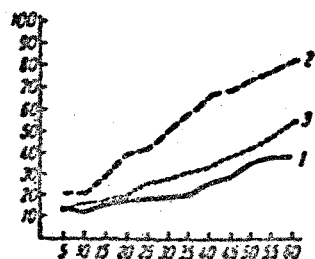


Fig. 1. Recovery of heart rate during vagal stimulation. Abscissa, time from beginning of stimulation (in sec); ordinate, heart rate (in percent of initial value). 1) control animals; 2) adrenalectomized; 3) adrenalectomized animals receiving DOCA.

Department of Pathological Physiology, Tomskol' Medical Institute (Presented by Academician V. V. Parin). Translated from *Doklady Akademii Nauk SSSR*, Vol. 63, No. 3, pp. 41-43, June, 1969. Original article submitted March 24, 1967.

Changes in the reaction of the heart to vagal stimulation in adrenalectomized animals can thus be largely prevented by administration of a small dose of mineralocorticoid.

#### LITERATURE CITED

1. É. N. Berger and V. A. Bolyarskaya, Probl. Endokrinol., No. 6, 66 (1966).