

CHARACTER OF ADRENALINE EFFECT ON THE LATENT PERIOD OF THE M-RESPONSE RAT SKELETAL MUSCLE DEPENDING ON THE CIRCULATING LEVELS OF TRIIODOTHYRONINE

Sobolev V. I

*V.I. Vernadsky Crimean Federal University, Simferopol, Crimea, Russian Federation
E-mail: v.sobolev@mail.ru*

The dependence of the effect of adrenaline on the value of the latent period of the M-response of the tibialis anterior muscle of white rats, depending on the circulating levels of free triiodothyronine within euthyroid zone and beyond has been studied in this paper. The experiments were performed on adult white male rats. 170 animals, which were divided into five groups, were used. The first group was the control rats (n = 50, euthyroid status). The animals of the second and third groups (n = 60) was treatment 3,5,3'-triiodothyronine (50 triiodothyronine Berlin-Chemie). The hormone was administered subcutaneously daily for 4 days in saline at a dose of 15 and 25 mkg/kg. Rats of the fourth group (n = 30) received triiodothyronine injection for 10 days at a dose of 25 mkg/kg.

During the experiment, the nerve was stimulated single electrical pulses of 100 mks at 2 pulses/sec. The amplitude the stimulator pulses was 300 mV. After registration, the M-response animals injected epinephrine intramuscularly at 0.3 mg/kg. Then after 15 min

the M responses were recorded again.

After the experience of the animal were decapitated. The blood sample was determined by the level of free triiodothyronine. Determination of hormone was conducted by the method of enzyme immunoassay. "ThermoLabsystems" system (Finland), and a standard set of reagents «ThyroidIFA triiodothyronine-free" production in Russia were used.

It was shown that intramuscular injection of epinephrine at 0.3 mg/kg shortened the by an average of 13 % of the latent period of M-response generation tibialis anterior muscle white rats (under the conditions in situ). It has been found that within the physiological range of free triiodothyronine level at euthyroid rats group (in this case 2.2 - 7.6 pmol/l) stimulating effect of adrenaline on the latent period of M-response generating skeletal muscle increases unevenly.

At the beginning of the concentration range of triiodothyronine (2.2 - 4.0 pmol/l) during the growth of level of triiodothyronine (based on regression analysis) effect of of adrenaline on the latent period of the M-response was not shown statistically significant ($b_{x/y} = - 0,014 \pm 0,008$). At the end of triiodothyronine concentration range (4.1 - 7.6 pmol/l) effect of epinephrine was increased in 3.5 times ($b_{x/y} = - 0,049 \pm 0,002$). At thyroidectomized rats the effect of adrenaline on the latent period of the M-response was not shown. Indeed, in the rats with euthyroid status the M-response latent period when stimulated by adrenaline shortened ($-0,36 \pm 0,05$ ms); in rats thyroidectomized group the adrenaline effect was 4 times lower ($-0,09 \pm 0,02$ ms).

Based on the results of the study has been constructed dependence of the adrenaline effect on the M-response latent period from the levels of free triiodothyronine in the blood of animals. On the curve of the dependence of adrenaline effect, depending on the circulating levels of free triiodothyronine in rats with different thyroid status (from euthyroidism to thyrotoxicosis) are 4 zone located in different sectors of the hormone concentration scale: the zone of growth of activating effect of adrenaline (the latent period is shortened), the zone of attenuation of stimulating effect of epinephrine, the zone of initial inhibition effect of epinephrine and the zone of intensive inhibition of the stimulating effect of epinephrine.

Keywords: muscle, M-response, thyroid status, the effect of adrenaline.

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