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STUDY OF FATIGUE IN THE DYNAMIC OF MUSCLE CONTRACTION IN RATS WITH DIABETES AND AFTER ADMINISTRATION OF COCARNIT

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The incidence of diabetic polyneuropathy (DP) in patients with diabetes (D) ranges from 40 to 60%. Electrophysiological studies of the fatigue development and speed-strength parameters of muscle contraction are limited. The perspective drug for treatment of DP is Cocarnit (C) (World Medicine). C is complex of nicotinamide, cocarboxylase, cyanocobalamin and disodium trihydrate adenosine triphosphate. The aim of the work was to investigate the development of fatigue processes of the neuromuscular complex in rats with D before and after introduction of C.

Materials and Methods. Study was carried out on 30 white nonlinear male rats (180-200g) which were divided into 3 groups: control – 1st group, 2nd group – rats with D and 3rd group — rats with D after injection of C during 9 days (1 mg/kg). D was induced by streptozocin (65mg/kg, i/p) and was confirmed by hyperglycemia and glucose-tolerant test. DP in rats with D was confirmed by analgesimeter. The study of the development of fatigue processes was made by non-relaxation electrostimulation at frequency of 1 Hz and 2 Hz. Estimation of fatigue development was carried out by the method of calculations of time intervals at achievable 50% and 30% levels of power response. The study of dynamic properties of muscle contraction was performed under conditions of muscle activation using modulated stimulation of efferents.

Results. Our study demonstrates that fatigue in rats with DP decreased to 50% advancing much faster (55s,

$p \leq 0,001$) than control group (300s). Contraction time of musculus gastrocnemius in the study of the fatigue processes in rats with DP decreased to 30% and was 165s ($p \leq 0,01$) in compared with appropriate control (400s) with stimulation of non-relaxation by electrostimulation of 1 Hz. After stimulation of non-relaxation by electrostimulation of 2 Hz fatigue in rats with DP decreased to 50% (39s, ($p \leq 0,001$)) when contraction time in control group was 300s. And contraction time of musculus gastrocnemius in the study of the fatigue processes in rats with DP decreased to 30% and was 82s ($p \leq 0,001$) in compared with appropriate control (400s). Analysis muscle maximum strength change, obtained under the influence of stimulating irritation of 1 Hz and 2 Hz with duration of 200s showed decrease on 70% ($p \leq 0,001$) and 95% ($p \leq 0,001$) from the entry level respectively.

Analysis of the development of fatigue processes showed that after the 9-day administration of C all the studied parameters are equal to the control value.

Key words: polyneuropathy, diabete, Cocarnit

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