

strength and tendon reflex reduction came under notice.

The reflex activity of over-segmental parts of the nervous system was studied on the neurophysiological complex «Viking IV M» of the firm Nicolet. The blink reflex was analyzed and registered. A blink reflex is a clinical phenomenon having diagnostic consideration at various forms of neurologic pathology. Contrary to the direct response of the orbicular muscle of eye registered at facial nerve stimulation, the blink reflex is a reflexory response and consists of 2 components: early (R1) and late (R2) ones. The reflex arch of the blink reflex includes the afferents of the trifacial nerve's first ramus, the afferents of the facial nerve, the nuclei of these cranial nerves and also the neurons of reticular formation of brainstem. The late response of the blink reflex reflects reflex activity of the brainstem reticular neurons.

The registration of the blink reflex was carried out by means of pickup electrodes, placing them on the orbicular muscle of both eyes. The stimulation was carried out in the output point of the trifacial nerve's first ramus from the one and then from the other sides. Measuring of the latencies R1 and R2 was carried out from the stimulus beginning and up to the beginning of the departure from the null line.

The results of the blink reflex research showed that there were authentic parameter changes of its late component (R2). First, lengthening of the latent period occurred, that was $32,2 \pm 1,7$ msec ($P < 0,05$) on the average; in its turn, this showing was in the range of $27,8 \pm 0,7$ msec in the healthy people. Second, the boundary of the blink reflex induction was $4,3 \pm 0,5$ mA ($P < 0,01$) in the hypothyroid patients; in its turn, the beginning of the reflexory response registration occurred at the stimulation intensity of $2,8 \pm 0,5$ mA in the healthy people.

Thus, the carried out research allows assuming that in hypothyroid patients the abirritation of over-segmental structures participating in the realization of brainstem reflexory activity occurs. These changes are associated with the thyroid hormones' deficit which causes the intensification of inhibitory control mechanisms participating in the brainstem reflexory activity realization.

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ANTIMICROBIAL EFFECTS OF SODIUM HUMAT FROM PEAT

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The study of antimicrobial effects of sodium humat is considered to be important because the majority of extracted strains of conventionally pathogenic bacteria are resistant to many broad-spectrum antibiotics.

For this purpose the following cultures were used: *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella* spp., *Citrobacter diversus*, *Staphylococcus aureus*. Cultures were grown on meat peptone agar. The filter disks soaked with 1%, 5% sodium humat solution were placed in a Petri dish with culture and then into a thermostat at 37° C. The findings were counted after 24 hours. The experiments showed that the agent had a bacteriological effect.

Rats were used for in vitro experiments. Incised flat wounds were made on their backs to make an experimental model of bacterial infection. One ml of 18-hour cultures grown on Hottinger broth (pH 7,2 - 7,4) with an optic density of 100 mln – 1 mld of colony forming units was placed on the wound. After a 4-day period, suppurative wounds of the experimental animals were treated with the ointment containing sodium humat at a concentration of 1%, 5% as well as a polyethyleneglycol ointment basis and synthomycin emulsion. After 3-7 days following the wound treatment with sterile tampons, the purulent material was taken and seeded in universal and differential-diagnostic media. Clean cultures were isolated and identified according to their cultural, morphological and biochemical properties.

It has been established that 1%, 5% ointment with sodium humat similar to the synthomycin emulsion has antimicrobial activity as related to *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella* spp., *Citrobacter diversus*, *Staphylococcus aureus*. The wound surfaces became pus free during a shorter period of time as compared to control animals. The wound

healing was faster in experimental groups in comparison with control rats.

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EFFECT LONG-TERM SPACE FLIGHT ON CONTRACTILE PROPERTIES HUMAN SKELETAL MUSCLE

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It is known that inactivity results in deconditioning and physiological deconditioning induced by inactivity affects important system of the body including musculoskeletal. Skeletal muscle deconditioning is associated with adaptation to a microgravity environment. These physiological changes may result in altered muscle function and motor control [Jaweed et al., 1995]. Decrements in motor performance could have negative implications for effective completion of mission-critical operational tasks. Up to now, owing to methodological difficulties, the property contractile properties of human skeletal muscles in a true weightless environment [Tschan et al., 1994; Day et al., 1995] or during its simulation [Grigorieva, Kozlovskaya, 1987; Sugajima et al., 1996] were beyond the field of vision of the scientists who in the main have concentrated on examining the mechanical features of the voluntary muscular contractions. This is the first study to make quantitative measurement of the functional properties of a single muscle in a man exposed to the long-term space mission. The investigation was concerned with the parameters of mechanical responses of the triceps surae muscle, which has been shown to be a postural antigravity muscle [Campbell et al., 1973]. The purpose of study were to analyze the effects of spaceflight the MIR-18 and MIR-22 mission on the mechanical changes of the triceps surae muscle. The methods for measuring electrically evoked and voluntary forces have been described in detail elsewhere [Koryak,

1997]. Briefly, the mechanical responses of the triceps surae muscle were recorded by tendometry, which made it possible to measure single muscle contraction force by the degree of tension change in muscle distal tendon [Koryak, 1995]. Maximal voluntary contraction (MVC), maximal twitch (P_t), tetanic forces (P_o) of isometric contraction elicited by electrical stimulation of tibialis nerve with a supramaximal rectangular pulses of 1 ms at a frequency of 150 Hz [Koryak, 1978], time-to-peak tension (TPT), a half-relaxation (1/2HR), and time of force development both during voluntary and evoked contractions to 25%, 50%, 75% of the MVC and P_o , respectively, before (60-d) and after (6-d) the MIR mission were evaluated as well. The difference between P_o and MVC expressed as a percentage of P_o and referred to as force deficiency has also been calculated. The surface EMG during contractile were recorded a one crewman with bipolar electrodes from the gastrocnemius and soleus muscles. EMG integral (IEMG) was calculated for gastrocnemius and soleus, but were than averaged. The IEMG/MVC ratio was also determined. After spaceflight, the TPT increased by 9%, but 1/2HR and P_t decreased by 18% and 14%, respectively. MVC and P_o decreased by 23% and 11%, respectively. Force deficiency increased by 36%. The value P_o/P_t ratio increased by 6%. The rate of rise a voluntary tension development decreased by 19%, 45%, and 20%, respectively. However, electrical evoked tetanic development not differ substantially from the initial data. The value EMG and IEMF/MVC ratio increased by 55%, and 71%, respectively. These findings indicate thus the alterations of contractile properties induced by spaceflight, were found to be booth of periferal and central nature but more central. However, relative less functional alterations of the triceps surae muscle compared to those observed after a 120-days bed-rest [Koryak, 1995] that may be related to countermeasure compliance.

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