AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 01, Issue 06, 2023 ISSN (E): 2993-2149

BIOCHEMICAL APPEARANCE OF FATIGUE AND ITS TYPES, BIOCHEMICAL CHANGES IN THE ORGANISM DURING REST AFTER MUSCLE WORK.

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Abstract: The development of a temporary decrease in muscle performance during each (short or long-term, intense) work activity is called a state of fatigue. This is not a pathological condition, but is considered a normal state of the body and performs a protective function. This article provides information on the biochemical manifestation of fatigue and its types, biochemical changes in the body during the period of rest after muscle work.

Key words: Biochemistry, fatigue, protective function, ATF, myosin, ketone bodies.

Fatigue indicates that dangerous biochemical and functional changes are approaching for the organism, and to prevent them, it automatically slows down the performance of the muscle. In the state of fatigue, the concentration of ATF (adenosine triphosphate acid) in nerve cells decreases and the biosynthesis of the neuromediator acetylcholine decreases. will change. As a result, the central nervous system's functions of generating motor impulses and sending them to the working muscles are disturbed, the speed of processing signals coming from proprioceptors and chemoreceptors slows down, protective braking related to the formation of gammaaminobutyric acid in the movement centers develops. In fatigue, the activity of the endocrine glands slows down, the production of hormones decreases, and the activity of a number of enzymes decreases. First of all, it concerns the activity of myofibril ATF-ase, which controls the conversion of chemical energy into mechanical energy. As the rate of breakdown of ATF decreases, the power of work done in myofibrils also decreases. In the state of fatigue, the activity of enzymes of the aerobic oxidation system decreases, and the connection of ATF resynthesis with oxidation reactions is disturbed. In order to maintain a certain amount of ATF at the same level, a further (secondary) increase in glycolysis occurs. This leads to an increase in the acidity of the internal environment and a violation of homeostasis. Increased protein

breakdown (catabolism) increases the amount of uric acid in the blood. When the working muscles are tired, the amount of stored energy substances (creatine phosphate, glycogen) is almost exhausted, decomposition products (lactic acid, ketone bodies) accumulate, and the internal environment of the cell begins to change dramatically. Control of the processes related to energy supply to the muscle is disrupted, significant changes occur in the activity of the respiratory and blood circulation systems through the lungs.

In most cases, fatigue is considered a holistic phenomenon, in which the causes of a decrease in ability can be the failure of any combination of the complex interconnected system of organs and functions or the violation of their interconnections. The conditions of muscle work include a decrease in the accumulation of energy substances, a decrease in the activity of the most important enzymes as a result of the negative effects of tissue metabolism products, a breakdown of structures due to a lack of plastic substances, changes in the nervous and hormonal control of functions, and many other things. can be a major cause of burnout. The main reason why a person gets tired during short-term intense work is the decrease in the activity of myosin-ATPase in the working muscles due to the effect of accumulated metabolites (intermediate products of metabolism) and the development of a protective stop in the MNS caused by the violation of the ATF/ADF balance. The main causes of fatigue during relatively moderate and long-term exercise are the malfunction of the energy supply mechanism (including the depletion of glycogen stores in the muscles or the accumulation of incomplete oxidation products of fats) and the intercellular transport of K+ ions. there may be factors related to the decrease in muscle excitability due to the release into the cavity. Accumulation of lactic acid in muscles and blood and depletion of energy substances (primarily glycogen) were previously considered to be one of the important causes of fatigue, but these processes are not decisive in fatigue. Observations show that in several cases the lactic acid content was high and the carbohydrate stores were not significantly depleted, and conversely, the lactic acid content was not high and the muscle and liver glycogen stores were still sufficiently high. In some cases, fatigue may develop.

A number of pharmacological drugs-nervous system supporters help to prevent fatigue. In order to reduce or completely eliminate the feeling of fatigue, doping is used in professional and even amateur sports. These substances include some purine derivatives, including caffeine structures, amines close to adrenaline and noradrenaline (including phenamine), male sex hormones and a number of other substances. They sharply reduce the activity of the adrenaline oxidase enzyme in tissues (primarily the nervous system) and resist the oxidation of adrenaline. Adrenaline increases tissue respiration and prevents the reduction of the intensity of the oxidation process and the activity of a number of enzymes during intense and long-term work of the muscles. As a result, protective braking in the body is removed or does not occur at all. The organism is deprived of the necessary protective reaction and continues to work "without internal control", bringing its internal environmental conditions to such a level that it becomes life-threatening. If a white mouse is forced to swim in warm water (30-32°), under normal conditions it can swim for 8-10 hours. When the mouse is taken from the water, it is very tired. If the water in its body is dried, heated and fed, it will return to its original state and after 1-2 days it will be indistinguishable from mice that did not swim in water. If a mouse is injected with phenamine, it can swim for 18-20 hours, but it dies after a while when it is taken out of water. An animal's life can be saved in very rare cases. Thus, doping is extremely dangerous for the body.

Usually, for the purposes of reducing fatigue, shortening the recovery period or increasing work capacity, substances that are harmless to the body and increase blood vessels, various vitamins and other medicinal substances are used. The types of fatigue are short, medium, and long-term, and are fully studied in the science of human physiology. During rest after work, the biochemical changes that occurred during exercise in muscles and other organs are gradually completed. The biggest changes are in energy exchange. As shown above, they consist of such changes that during work, the substrates of energy metabolism in muscles - creatine phosphate, glycogen, and during long-term exercise, the amount of fat decreases, and vice versa, the products of intracellular metabolism - ADF, AMF, H3PO4, lactic acid, the amount of ketone bodies and others increases. Accumulation of work-related metabolic products and increased hormone activity increase oxidative processes in tissues during fatigue after work.

References:

1. Volkov N.I. Biochemical control in sports. Theory and practice of physical culture, No. 11, 1975.
2. Volkov N.I. Problema utomleniya i vosstanovleniya v teorii i praktike sporta. Theory and practice of physical culture, No. 1, 1974.
3. Zasiorsky V.M. Physicheskie kachestva sportsmena. Gl. III. — M., 1966.
4. Kaminsky M.I., Pshendin A.I. Rational diet of sportsmen. - Kiev, 1985.
5. Korobov L. II., Volkov N I . Factory, defining uspex v bege. Legkaya athletics, No. 11, 12, 1983.