

Reasons of Body Fatigue during Sports

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Abstract: The article discusses the causes of fatigue of athletes during sports loads. Health is an invaluable gift that nature presents to a person. In order to preserve sports health and strengthen it, in order to improve health and prevent diseases, it is necessary to engage in physical culture intelligently. To resist adversity, you need to know your body and ensure its ability to overcome harmful influences and consequences by self-healing methods. Each of us needs to strengthen our health gradually. The article discusses the causes of fatigue of athletes during sports loads.

Key words: physical exertion, fatigue, overwork, strenuous work, chronic fatigue, performance, body, athletes.

MATERIAL AND METHODS

The search for literary sources was carried out using the bibliographic databases Web of Science, Scopus, DBLP, Medline. When selecting sources, they paid attention to experimental articles, literary reviews, the number of their citations over the past year.

The main and objective sign of fatigue is a decrease in his performance. With fatigue, performance decreases temporarily, but it quickly recovers with daily, normal rest. The state of fatigue has its own dynamics - it increases during work and decreases during rest (active, passive and sleep). Fatigue should be considered as a natural normal functional state of the body during labor. Another important criterion for assessing fatigue is the change in body functions during work. At the same time, depending on the degree of fatigue, functional shifts can be of a different nature. In the initial stage of fatigue, clinical, physiological and psychophysiological indicators are characterized by instability and multidirectional nature of changes, however, their fluctuations, as a rule, do not go beyond physiological norms. In chronic fatigue, especially overwork, there is a unidirectional significant deterioration in all functional parameters of the body with a simultaneous decrease in the level of a person's professional activity. Let's review the main theories of fatigue. The main theories of fatigue include the following: 1). depletion of energy resources in the muscles, 2). clogging of muscles with metabolic products, 3) poisoning with metabolites 4) suffocation due to lack of oxygen. These local humoral versions do not fully reveal the mechanisms of fatigue, since only changes in muscle tissue are considered as its main cause [1]. The most popular and scientifically studied theory of fatigue, formulated by I.M. Sechenov in 1903, comprehensively development and supplemented by A.A. Ukhtomsky, connects the occurrence of fatigue only with the activity of the nervous system, in particular, the cerebral cortex [2]. It was assumed that the

basis of the mechanism of fatigue is the weakening of the main nervous processes in the cerebral cortex, a violation of their equilibrium with the relative predominance of the excitation process over the weaker process of internal inhibition and the development of protective inhibition. The current electrophysiological and biochemical research methods and the data obtained do not allow to reduce the causes of fatigue to changes in any organ or organ system, including the nervous system. Therefore, it is inappropriate to attribute the occurrence of primary fatigue to any one system [3].

The main factor that causes fatigue is the physical or mental stress that falls on the afferent systems during work. The relationship between the magnitude of the load and the degree of fatigue is almost always linear, that is, the greater the load, the more pronounced and early fatigue is. In addition to the absolute value of the load, the nature of the development of fatigue is also affected by a number of its features, among which it should be noted: the static or dynamic nature of the load, its constant or periodic nature, as well as the intensity of the load. With the main factor, namely workload, leading to fatigue, there is a list of additional or contributing factors. These factors by themselves do not lead to the development of fatigue, however, combined with the action of the main one, contribute to an earlier and more pronounced onset of fatigue.

Additional factors include: 1. Environmental factors (temperature, humidity, gas composition of air, barometric pressure, etc.); 2. Household factors, namely, violation of the regime of work and rest; 3. Changing the usual daily biorhythms and turning off sensory stimuli; 4. Socio-psychological factors - motivation, relationships in the team, in the family, etc.

The main symptom of fatigue is a decrease in working capacity, which, in the process of performing various physical exercises, changes for different reasons, therefore, the physiological mechanisms of the development of fatigue are different. These mechanisms are determined by the power of work, its duration, the nature of the exercises, the complexity of their implementation, etc.

When performing periodic work of a high degree of power, the cause of a decrease in efficiency and the development of fatigue is a decrease in the mobility of the main nervous processes in the central nervous system, with a predominance of inhibition due to a large flow of efferent impulses from the nerve centers to the muscles and afferent impulses from the working muscles to the centers. The working system of interconnected activity of cortical neurons is destroyed. In addition, the level of ATP and creatine phosphate decreases in neurons, and the content of an inhibitory mediator, gamma-aminobutyric acid, increases in brain structures. At the same time, a change in the functional state of the body muscles themselves, a decrease in their excitability, lability and the rate of relaxation are of great importance in the development of fatigue. With cyclic work of maximum power, the leading causes of fatigue are inhibition of the activity of nerve centers and a change in the internal environment of the body. The reason for this is an acute lack of oxygen, as a result of which hypoxemia develops, the pH of the blood decreases, and the content of lactic acid in the blood increases by 20-25 times. Oxygen debt reaches its maximum values - 20-22 liters. Under oxidized metabolic products, absorbed into the blood, impair the activity of nerve cells. The intense activity of the nerve centers is carried out against the background of acute oxygen deficiency, and this leads to the rapid development of fatigue. Periodic high-intensity work leads to the development of fatigue due to discoordination of motor, as well as autonomic functions. For several tens of minutes, a very intense work of the cardiovascular and respiratory systems must be maintained to provide an intensively working body with the necessary amount of oxygen. During this work, the oxygen demand slightly exceeds the oxygen consumption and the oxygen debt reaches 12-15 liters. The total energy consumption during such intense work is very high, while up to 200 g of glucose is consumed, which leads to some decrease in glucose in the blood. There is

also a decrease in the blood hormones of some endocrine glands (pituitary gland, adrenal glands). The duration of the cyclical work of moderate power leads to the development of protective inhibition in the central nervous system, depletion of energy resources, tension of the functions of the oxygen transport system, tension of the glands of the internal system and changes in metabolism. The body's stores of glycogen decrease, which leads to a decrease in blood glucose. A significant loss of water and salts by the body, a change in their quantitative ratio, and a violation of thermoregulation also lead to a decrease in performance and the occurrence of fatigue in athletes. In the mechanism of the development of fatigue during prolonged physical exertion, they play a certain role in changing protein metabolism and reducing the functions of the endocrine glands. At the same time, the concentration of gluco- and mineral corticoids, catecholamines and thyroid hormones decreases in the blood. As a result of these changes, and as a result of the prolonged influence of monotonous afferent stimuli, inhibition occurs in the nerve centers. The suppression of the activity of these centers leads to a significant decrease in the effectiveness of the regulation of movements and a violation of their coordination. In different climatic conditions, with prolonged performance of work, the development of fatigue can be accelerated by a violation of thermoregulation. With different types of acyclic movements, the mechanisms for the development of fatigue are also not the same. Namely, when performing situational exercises of different power, the higher part of the brain and sensory systems experience a great load, since athletes need to constantly analyze the changing situation, program their actions and switch the pace and structure of movements, which leads to the development of fatigue in his body.

In different sports (for example, football), the main role belongs to the lack of oxygen supply and the development of oxygen debt. When performing gymnastic exercises, as well as in martial arts, fatigue develops as a result of a deterioration in the carrying capacity of the brain and a decrease in the functional state of muscles, while their strength and excitability decrease, the rate of contraction and relaxation decreases. During static work, the main cause of fatigue is the continuous tension of the nerve centers and muscles, the shutdown of the activity of less stable muscle fibers and a large flow of afferent and efferent impulses between muscles and motor centers. With fatigue, which is a normal functional state of the body during work, its symptoms disappear completely during regulated rest. With prolonged, intensive work, violation of the regime of work and rest, indicators of fatigue accumulate, as a result of which it turns into chronic fatigue and overwork [4].

Chronic fatigue of the body is a borderline functional state of the body, which is characterized by the preservation of subjective and objective signs of fatigue from previous work by the beginning of the next working period, for the elimination of which additional rest is necessary. Chronic fatigue occurs during long-term work in violation of work and rest regimes. Its main subjective signs are a feeling of fatigue before the start of a working day, fatigue, irritability, unstable mood; objective signs are a pronounced change in body functions, a significant decrease in sports results and the appearance of erroneous actions. In chronic fatigue, the required level of sports performance can be maintained only for a short time due to an increase in the biological price and the rapid consumption of the body's functional reserves. To eliminate unfavorable disorders of the body's functions and preserve sports performance, it is necessary to eliminate violations of the training and rest regimes. Provide athletes with extra-long rest. If these measures are not followed, chronic fatigue can turn into a state of overwork.

Objective signs of fatigue are abrupt changes in body functions, some of which are outside the normal range, increased sweating, shortness of breath, weight loss, impaired attention and memory, atypical reactions to functional tests, which are often not completed. The main objective criterion for overwork is a sharp decline in sports results and the appearance of gross errors when performing special physical exercises[5]. Athletes with signs of fatigue should be excluded from

various types of training and competition. They must undergo medical treatment corrections. The quantitative assessment of the performance of various specialists, studied in recent years by labor physiologists, made it possible to establish that a decrease in direct and indirect indicators of performance up to 15% in comparison with the initial, indicates the presence of fatigue in the body, 16-19% indicates the presence of chronic fatigue, and a decrease 20% or more indicates the onset of a state of overwork.

CONCLUSION

Overwork is a pathological condition of the body, which is characterized by a constant feeling of fatigue, lethargy, disturbed sleep and appetite, pain in the heart and other parts of the body. Additional rest is not enough to eliminate these symptoms, and this condition requires special medical treatment.

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