

THE MECHANISM OF THE HEALING EFFECT OF PHYSICAL EXERCISES ON THE CARDIOVASCULAR SYSTEM

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Abstract

Exercise and sports are of great importance in strengthening the health of young people in our country, increasing the level of physical fitness and maturing their ability to work. Exercise and sports are considered the main tools in the comprehensive physical development of people.

Keywords: Physical culture, healthy personality, maturity, personality health.

Introduction

The effect of exercise on the cardiovascular system is associated with changes in the functions of the respiratory, nervous, endocrine and movement systems. Changes in the body under the influence of Physical Education go through immediate and long-term adaptation stages.

In the process of physical education, mechanisms are formed that are the basis for adaptation and give the trained body advantages over the untrained:

- a trained organism can do muscle work of such duration and intensity that an untrained person cannot do;
- the trained organism is distinguished by the more economical operation of physiological systems during rest and moderate physical exertion, as well as the ability to achieve a high level of functioning of these systems with maximum strength;
- a trained organism increases its resistance to harmful influences and negative factors.

At the level of the circulatory system, adaptation is manifested in the development of changes in the heart. In the myocardium, the number of capillaries and the capacity of the coronary bed increases, the amount of myoglobin increases, etc. The result of systemic changes in the myocardium is an increase in the maximum speed of contraction and relaxation of the heart muscle, the maximum values of blood vessels and minute volumes, and an increase in heart rate.

In parallel with the change in the functions of the respiratory system, an increase in the functioning of the circulatory system, and at the same time its economy, is formed. Due to the improvement in the strength of the respiratory muscles and their ability to contract, the vital capacity of the lungs increases, and the level of oxygen use increases. Along with an increase in the maximum ventilation of the lungs during physical labor, an increase in the number of mitochondria in skeletal muscles leads to a significant increase in the aerobic capacity of the body. Increasing the ability of the respiratory center to maintain a high level of excitability for a long time gives the trained body the opportunity to perform maximum ventilation during prolonged intense physical exertion.





The neurohumoral regulatory apparatus changes, as a result of which a reorganization of the motor reaction occurs in response to changes in requirements. The restoration of the hormonal connection of regulation during training increases the ability of the adrenal cortex to synthesize corticosteroids and the reserve strength of the endocrine function of the pancreas. In trained people, insulin secretion decreases, its concentration in the blood decreases at rest, and the insulin reaction to carbohydrate food and physical activity decreases.

These changes play an important role in the beneficial effect of training on fat metabolism, as well as in the Prevention of obesity and atherosclerosis. This is because a decrease in insulin secretion in response to carbohydrate food reduces the stimulation of triglycerides in the liver, especially low-density lipoproteins. It prevents hyperinsulinemia, obesity and diabetes.

At the level of the central nervous system, structural changes in the muscle work control apparatus provide opportunities to mobilize more motor units during exercise, improve inter-muscular coordination, and increase muscle performance.

An increase in muscle strength and endurance, especially in the lower limbs, contributes to an increase in the function of extra-cardiac factors of blood circulation, which include contractile activity of skeletal muscles, valve apparatus of vessels, absorption function of the chest, cardiac cavities and changes in the difference in large vessels and arteriovenous oxygen. An important role in blood circulation is also played by the "intramuscular heart" - the constant contraction of the individual myofibrils of skeletal muscle, which generate vibrations transmitted to the walls of blood vessels. Accordingly, the greater the number and strength of the working units in the muscle, the more active the peripheral circulation.

In the process of forming adaptation to physical exertion, physiological blood circulation protection joints are formed, which are characterized by: an increase in the strength of antioxidant systems that limit stress disorders, lipid peroxidation is activated in their development. important; increase the body's resistance to factors that harm the heart and the circulatory system in general; decrease in the demand for myocardial oxygen during exercise.

In the process of adaptation, the ability of tissues to extract oxygen from the blood increases due to an increase in the concentration of myoglobin and the strength of the mitochondrial system in skeletal muscles. In addition, it increases the resistance of the heart and circulatory system to heavy loads and hypoxia. Of great importance in the physiological protection of the circulatory system is the increase in the capacity of the myocardium's energy supply system, which is mainly able to prevent disturbances in its metabolism, Depression of contractile function and other diseases caused by overload of the heart.

Positive adaptive changes, components of an organism's preferences, develop primarily during aerobic loads, that is, during endurance training. People with high levels of endurance can do more work, spend more energy, and use more oxygen than those who are not resistant.

Endurance is ensured by the complex interaction of almost all body systems. Mechanisms of adaptation during aerobic training:

- increase endogenous cue reserves (glycogen and triglycerides) in red muscle fibers;
- increase the content of the main enzymes;
- increase in the number of mitochondria in space;
- decrease in activity of anaerobic metabolism enzymes with an increase in the potential of aerobic processes.





Systemic changes that occur in the process of adaptation to physical exertion are able to have a positive therapeutic and prophylactic effect that prevents the development of diseases of the cardiovascular system. Regular and adequate physical education has a positive interaction with ischemic and stress-related heart diseases. As a result of the formation of adaptation to physical exertion, the vascularization of the heart increases and the coronary circulation improves, the power of the energy supply and ion transport systems in the myocardium, the strength of the contraction apparatus of the heart muscle increases. Positive changes are formed in the anticoagulant system of the blood, in the endocrine system and in various metabolic processes that affect the development of atherosclerotic changes in the vessels of the heart and brain.

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