

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Physiological Significance Of The Active Muscle Activity Of The Body.

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ABSTRACT

Swimming is a versatile and very useful form of exercise. It strengthens the heart and blood vessels, muscles, immunity, trains breathing, relieves stress and nervous tension, relaxes and tones. Swimming - this is the unique version of physical activity, when you can simultaneously get pleasure and improve the body. As a result of swimming lessons on the human body is a diverse positive effects. Under the influence of systematic swimming lessons there is a restructuring and improvement of the whole human body. All this taken together improves health, improves overall performance. The reaction of the nervous system under the influence of water procedures far exceeds in degree the same reactions that occur when performing exercises in air. Water, acting on skin receptors, increases the electrical activity of neurons, forcing the nerve cells to work more actively. Swimming has a balancing effect on the autonomic nervous system, moderately reducing the tone of its sympathetic division and increasing the activity of the parasympathetic. This leads to the normalization of the cardiovascular system (reduced peripheral vascular resistance, normal heart rate, decreased blood pressure), respiratory (increased activity of the respiratory center, which leads to increased breathing, improved blood supply to the lung tissue, significant enrichment of blood with oxygen), digestive systems.

Keywords: sport, physical activity, health, functional state, organism, swimming.

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INTRODUCTION

It has long been clear that swimming is one of the most versatile and very useful types of physical activity [1,2]. The effect of regular activities of this sport is huge [3-6]. It strengthens the heart [7], blood vessels [8], muscles [9], immunity [10], trains breathing [11], relieves stress [12] and nervous tension [13], relaxes [14] and tones [15]. Swimming is a unique variant of physical activity, when you can simultaneously get pleasure and improve your body [16-20].

Swimming is a sport that can be practiced by everyone, regardless of age and health [21]. In most cases, visiting the pool, even at the amateur level, is an effective prevention [22,23] and an important component of the treatment of many diseases [24,25].

When compared with other types of aerobic training, in which the body encounters air resistance, swimming has the greatest efficiency [26,27]. Water, as the external environment, resists movements 12 times more than air, this creates a load on the whole body at once [28].

Being in water, a person experiences sensations, in many respects similar to the state of weightlessness, since the density of water is 769 times the density of air [29]. This circumstance allows a person to be in it in a relaxed anti-gravity state. Considering these moments, the goal was set in the work: to consider aspects of the effects of swimming on the human body.

The effect of swimming on the human body as a whole

As a result of swimming in the body, the hardening process takes place, resistance to environmental factors is increasing. Therefore, dosed swimming can be very useful for people prone to colds. In this regard, swimming is one of the most effective in relation to health sport [30]. Even immersing a person in water causes an increase in the functions of various organs: breathing becomes faster, the heart rate rises, and the metabolism increases [31].

Swimming has a beneficial effect on many functional systems of the body [32]. It strengthens the respiratory muscles, increases the mobility of the joints of the chest, increases lung capacity and ventilation capacity of the lungs. All this greatly enhances the function of the respiratory system. Swimming reduces the gravitational load on the spine. This strengthens the muscular corset of the chest, which leads to improved posture. At the same time, there is a positive effect of the aquatic environment on the nervous system, which is manifested in the stimulation of brain activity, the accelerated elimination of fatigue phenomena during strenuous mental work, and an increase in the mobility of the nervous processes. The hydromassage of the skin arising in the course of swimming contributes to the improvement of the regulation of the vegetative functions of the whole organism, the reflex stimulation of the cardiovascular system, and the activation of the peripheral circulation. Under these conditions, an increase in the body's resistance to the effects of low temperatures is observed.

Effect of swimming on the brain

Swimming also has a beneficial effect on the central nervous system [33]. As a result of the exercises, excitement and inhibition are balanced, and the blood supply to the brain improves. The feeling of weightlessness that occurs in water has a beneficial effect on the psyche, creating a positive emotional charge [34]. Swimming has proven to be a good remedy for depression, fatigue and insomnia. Swimming helps to improve memory and attention, elevate mood, relieve irritability and fatigue [35]. Regular swimming tempers well. This increases the body's resistance to low temperatures. And as a result - the body is better resistant to microorganisms and viruses [36,37].

Any water activities, including water polo, synchronized swimming, aqua aerobics, or even swimming in flippers, is the best tool for optimizing the operation of synapses in the brain [38].

Water relaxes, soothes and relieves neuropsychic tension in children [39]. It balances the flow of mental processes in children with pathology, improving their memory and attention [40]. In addition, swimming has a curative effect on insomnia, anxiety and phobias [41].

Swimming is also an effective prevention of cerebral palsy, nervous tic, Parkinson's disease [42]. It is able to improve vision, contributes to the formation of good mood, increases vitality and develops self-confidence [43,44].

Swimming and cardiovascular system

Cardiovascular diseases entail disruption of the work of almost all human systems, including respiratory, nervous, digestive, muscular [45,46]. This is because when patients with the heart and blood vessels are not able to provide the entire body with enough oxygen and nutrients [47]. Of the oxygen that comes in with blood, the heart and the brain consume most of it. Therefore, to maintain health, it is important to maintain the cardiovascular system in a healthy state [48].

Swimming lessons create favorable conditions for the cardiovascular system. A swimmer in the water does not have to experience the static tension of the muscles necessary to maintain the balance of the body in an upright position when walking, which also facilitates the work of the heart. The water pressure on the surface of the horizontal body of swimmers facilitates the outflow of blood from the periphery to the center. Rhythmic muscle contractions in combination with deep breathing during swimming strengthen venous blood to the heart. Under these conditions, it distributes blood to the periphery horizontally rather than vertically, as usual, that is, it works under light conditions. Muscles, contracting, act as a pump, helping push blood through the venous system to the heart. All this has a very positive effect on the circulatory organs [47,48]. When the body is immersed in water, the heart is able to pump a large amount of blood. In addition, the low temperature of the water quickly returns blood from the skin to the central vessels and to the internal organs [49].

People swimming, heart more enduring. At rest, it is reduced no more than 60-65 times in 1 minute. With such a rhythm, the heart itself rests more, manages to get the right amount of blood through its network of capillaries [50]. In addition, a trained heart works more economically than non-swimmers. The high force of contraction of the muscles of the heart increases its functionality. At the same time, the economization of the work of the cardiovascular system is manifested not only at rest. When performing the same muscular work in people involved in swimming, to a lesser extent than the untrained, the heart rate, the minute volume of blood and the systolic pressure increase [51].

Systematic swimming exercises have a positive effect on the state of blood vessels: their elasticity increases, energy metabolism increases in their walls, and regeneration processes flow faster [52]. This prevents the deposition of cholesterol in the vessel walls [53,54]. There is evidence that the lumen of the arteries of the swimmers increases by 1.5 - 3 times [55-57]. This is an important reason that people who swim have arterial blood pressure consistently normal.

CONCLUSION

In the course of swimming lessons on the human body is a pronounced diverse positive effects. This type of physical training due to the motor activity and the aquatic environment leads to large physiological changes in almost all human organs and systems. It improves health and improves overall performance. The reaction of the nervous system under the influence of water procedures far exceeds the reactions that occur in it in conditions of air. This is due to the fact that water, acting on skin receptors, increases the electrical activity of neurons, causing the nerve cells to work more actively. Having a balancing effect on the autonomic nervous system, swimming moderately reduces the tone of its sympathetic section and increases the activity of the parasympathetic. This leads to the normalization of the cardiovascular system (reduced peripheral vascular resistance, normal heart rate, decreased blood pressure), respiratory (increased activity of the respiratory center, which deepens breathing, improves blood supply to the lung tissue leads to a significant enrichment of blood with oxygen).

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