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THE INFLUENCE OF TENNIS ON THE FORMATION OF HUMAN FUNCTIONAL SYSTEMS

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Abstract:

Tennis is one of the most effective means of maintaining vitality and improving health. In addition to physical activity, it also gives a great emotional charge, creates a good mood and gives a sense of satisfaction with one's activity, which is no less important than physical activity.

Keywords: tennis, physical culture, sports, physiological education, physical recovery, formation, physical activity

The formation of man at all stages of his evolutionary development took place in close connection with active muscular activity. The human body develops in constant motion. Nature itself ordered that a person needs to develop his physical abilities.

Motor failure goes completely unnoticed, and is often accompanied by even a sense of comfort. With a lack of motor activity, the body's resistance to colds and the action of pathogens decreases. Persons leading a sedentary lifestyle are more likely to suffer from respiratory and circulatory diseases. A decrease in physical activity, combined with a violation of the diet and an unhealthy lifestyle, leads to the appearance of excess body weight due to the deposition of fat in the tissues.

Tennis is one of the more interesting sports games that has become more and more popular in recent years. Tennis is available to everyone, and people of all ages are fond of it. It is fashionable to see how eight- and nine-year-old girls and boys are just learning to play, how girls and boys take part in competitions, how adult tennis players aged 60 and over enthusiastically "fight" on the courts.

Tennis develops muscles, increases blood circulation, improves heart function, increases lung capacity, deepens breathing. It develops dexterity, speed of reaction, endurance, develops an eye, the ability to prudently expend one's strength, and gives vigor. Tennis players strengthen the nervous system.

Tennis is becoming one of the most popular sports. Its increased popularity attracted thousands of people of all ages to the courts.

Both children and adults play tennis: those who have never been involved in sports and even avoided physical education classes in their school years, and Olympic champions who have finished playing big-time sports, but strive not to break with sports, to keep their sports shape as long as possible . And it's natural.

Modern tennis refers to athletic sports that require the comprehensive development of physical, mental and volitional qualities. During the game, the tennis player is constantly in motion. He makes many jumps, jerks, strikes the ball in a variety of ways, and leads a tense psychological struggle with the enemy.

Playing tennis is a fun activity. Thousands of people improve their health with its help.

It should be noted and some other advantages of tennis. Most sports games - hockey, football, basketball, volleyball and others - require the participation of two playing teams. In tennis, it is enough to have one partner to enter the court. In addition, learning to play can be started at any age and played until old age. So, the Frenchman Edmond Barr was the world champion among professionals for about 30 years, losing this title only at the age of 60.

Playing tennis is a great way to harden the body. It develops such qualities as perseverance, endurance, willpower, and therefore can be successfully used for the physical education of students both in order to achieve high sports results, and for their comprehensive development, preparation for active work.

THE PURPOSE OF THIS WORK is to summarize rather disparate information about changes in the musculoskeletal system, cardiovascular system, respiratory system, and metabolism.

TO ACHIEVE THIS GOAL, THE FOLLOWING TASKS WILL BE SOLVED:

1. Motor sphere - coordination of movements, rhythm, "feeling of the ball and racket", responsiveness; physical qualities - speed of movement, flexibility, agility, speed endurance, accuracy of spatial estimates;
2. Emotional-volitional sphere - initiative, determination, purposefulness, the ability to concentrate attention for a long time, the ability to distribute attention, mental endurance, the ability to regulate one's mental state, focus on high results.

A huge number of people of different ages are engaged in physical culture in order to improve their well-being, improve health, become strong, dexterous, enduring, have a slender figure, well-developed muscles. Physical education is, as it were, a compensation for the fact that

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we are deprived of such natural physical activities as running, jumping, swimming, walking, and so on.
Performing physical exercises, a person enters the world of new sensations, positive emotions, acquires a good mood, cheerfulness, cheerfulness, feels a surge of strength. Medical science has established that systematic physical education, compliance with the correct motor and hygienic regime are a powerful means of preventing many diseases, maintaining a normal level of activity and working capacity of the body. When performing physical exercises from working muscles, joints and ligaments, a large number of signals come to the central nervous system, in particular, to the cerebral cortex, which, in turn, are sent from the central nervous system to all internal organs - to the heart, lungs, muscles and so on. There is an increase in cardiac activity and respiration, the speed of blood flow through the vessels increases, blood pressure rises, and metabolism increases.
The degree of change in the activity of internal organs depends on the nature of the work; the more complex and intense the muscle movement, the more pronounced the changes in the internal organs. Regular exercise, especially in combination with breathing exercises, increases the mobility of the chest and diaphragm. In those involved, breathing becomes rarer and deeper, and the respiratory muscles become stronger and more resilient. With deep and rhythmic breathing, the blood vessels of the heart expand, resulting in improved nutrition and oxygen supply to the heart muscle. Under the influence of regular physical exercises, human muscles increase in volume, become stronger, their elasticity increases; in the muscles, the number of functioning capillaries increases several times, which, at rest, are in a collapsed position and blood does not pass through them. With muscle contractions, the capillaries open, and an increased movement of blood begins in them. As a result, venous stasis decreases, the total amount of circulating blood increases and oxygen delivery to organs and tissues improves.

CHANGES IN THE MUSCULOSKELETAL SYSTEM :

The main functional load in sports falls on the musculoskeletal system, that is, on the system of muscles, bones, joints, ligaments and tendons. Bones in the human body play the role of support, protection and leverage. Muscles are attached to the bones by means of tendons or directly adhere to the bones, intertwining with the fibers of the periosteum (or rather, the shell of the bone). The closer the place of attachment of the muscle to the point of rotation of the bone (joint), the faster the movements at the other end of the lever will be performed and the less the force of movement will be. An example of such a mechanism is the shoulder muscle (biceps, triceps), which are attached immediately after the elbow joint (the place of their attachment can be felt if these muscles are slightly strained). On the other hand, the deltoid muscle attaches in the middle third of the shoulder and develops more strength. Under the influence of training, the bones undergo significant restructuring. The process of bone renewal is ongoing, with some parts of the bone resorbed while others are restored. In athletes, the bones are rebuilt in accordance with the load. In this case, the lines of loads coincide with the lines of bone stiffness (concentration of bone substance). Therefore, regular exercise strengthens the bones.
Under the influence of physical activity, the ligaments and tendons thicken and become stronger. In trained people, the strength of the ligaments reaches such a value that, during injuries, a piece of bone with a ligament attached to it comes off, and the ligament itself remains intact. Regular moderate exercise has a positive effect on the joints. The range of motion in the joint increases, the cartilage tissue thickens. Excessive physical activity can adversely affect the condition of the joints. Professional athletes often develop a disease such as osteoarthritis or osteochondrosis, in which the destruction of articular cartilage occurs. For the normal development of bones, ligaments and joints during sports, it is necessary to provide the body with the necessary minerals and vitamins. Vitamin C stimulates the development of connective tissue, ligaments and tendons, and calcium and phosphorus give bone hardness.

CHANGES IN THE CARDIOVASCULAR SYSTEM :

The cardiovascular system is designed to circulate blood and supply tissues with oxygen and nutrients. Regular exercise has a stimulating effect on the heart. At the same time, the muscles of the heart thicken a little and become more resilient. In trained people, the heart rate (pulse) slows down at rest. This is due to the fact that a trained heart pumps more blood in one contraction than an untrained one.
The walls of the blood vessels of athletes become more elastic and resilient. The beneficial effect of sports on the veins of the legs is especially pronounced. When the muscles contract, the walls of the veins are compressed, thereby the blood from the veins is pumped faster to the heart. Moderate exercise helps prevent varicose veins and vein thrombosis in the lower extremities. The number of red blood cells in the blood of athletes

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increases, which improves the supply of oxygen to tissues.

CHANGES IN THE RESPIRATORY SYSTEM : The lungs of trained people differ significantly from those of non-athletes. First, in the lungs of an athlete, the bronchi expand and additional alveoli (air sacs) open, thereby increasing the vital capacity of the lungs. Secondly, the lungs of a trained person are much better supplied with blood . Due to this, oxygen saturation of the blood increases, and, consequently, the supply of oxygen to all organs and tissues of the body.
Thanks to improved ventilation of the lungs, people involved in sports are much less likely to get sick with bronchitis and pneumonia.

CHANGES IN METABOLISM: Moderate physical activity has a beneficial effect on the metabolic processes in the body.
Protein metabolism in athletes is characterized by a positive nitrogen balance, that is, the amount of nitrogen consumed (mainly nitrogen is found in proteins) exceeds the amount of nitrogen excreted. Negative nitrogen balance is observed during illness, weight loss, metabolic disorders. In people involved in sports, proteins are used mainly for the development of muscles and bones. While in untrained people - for energy (in this case, a number of substances harmful to the body are released).
The metabolism of fats in athletes is accelerated. Much more fat is used during physical activity, hence less fat is stored under the skin. Regular exercise reduces the amount of so-called atherogenic lipids, which lead to the development of a serious disease of the blood vessels - atherosclerosis.
The metabolism of carbohydrates during sports is accelerated. At the same time, carbohydrates (glucose, fructose) are used for energy, and are not stored in the form of fats. Moderate muscle activity restores tissue sensitivity to glucose and prevents the development of type 2 diabetes. To perform fast power movements (lifting weights), carbohydrates are mainly spent, but during prolonged non-strong loads (for example, walking or slow running), fats are consumed.
In general, moderate exercise has a general healing effect on the body. Regular physical activity is an important preventive measure against diseases of the cardiovascular system (hypertension, coronary heart disease, atherosclerosis), metabolic disorders (type 2 diabetes), diseases of the musculoskeletal system (osteochondrosis, arthrosis).
It should be noted that only moderate physical activity (comparable to a person's physical abilities) has a beneficial effect on his health. Excessive physical activity is dangerous for the body and can lead to various diseases.
In general, sports are recommended for everyone. You just need to sensibly assess your abilities and choose a sport that will bring pleasure. It can be simple walking or cycling, slow running, swimming, aerobics, fitness. All forms of movement are useful, as long as they correspond to the physical abilities of the organism, and their performance brings pleasure.
A feature of modern tennis is the uncertainty of the number of actions, their time and the total amount of load.
It is best to control the strength training of tennis players in the laboratory, using special equipment for this purpose, which allows measuring the strength of muscle groups that carry the main load in tennis. However, under normal conditions, in training practice, you can use the measurement of backbone strength as an indicator of the athlete's overall strength, the number of push-ups, pull-ups (for men). It is also advisable to measure the strength of the hand in tennis players.
Speed is a set of properties that characterize the speed abilities of a person.
Usually, elementary and complex forms of manifestation of speed are distinguished. The elementary ones include: the time of a simple reaction, the time of a single movement and the frequency of one joint movements. The complex forms of manifestation of speed include: the time of a complex reaction (reaction to a moving object and reaction of choice) and the frequency of multi-joint movements.
It is known that the speed manifestations are slightly dependent or not at all dependent on each other. This means that an athlete can have excellent reactions, but move slowly through the distance, and so on. The speed qualities of tennis players will largely depend on all forms of manifestation of speed.
The manifestation of speed abilities in tennis players: speed of reaction; speed of a single movement; speed, manifested in the frequency of multi-joint movements.
When educating the speed of reaction to a moving object, it is advisable, firstly, to increase the speed of the ball, secondly, to increase the suddenness of its appearance, and thirdly, to shorten the flight path. However, it should be said that when using these guidelines, you can apply all kinds of exercises, not necessarily with a tennis ball. It can be a puck, a football, a basketball, and other balls, for example, a ball smaller than a tennis ball.
Regular tennis lessons have a beneficial effect on many body systems, in particular, they develop the respiratory

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system. Thanks to respiratory movements, constant ventilation of the lungs occurs, an indicator of which is the minute volume of respiration (MOD) - the amount of air passing through the lungs in 1 minute. At rest, the MOD is 5-8 liters, and during exercise it increases and reaches 150-180 liters. Usually at rest, a person consumes 200-300 ml of oxygen per minute. While playing tennis, oxygen consumption rises to 2-3 l/min. And this is natural. Muscular work is unthinkable without an increase in gas exchange, since energy is drawn from the process of oxidation of organic substances. Even with small physical exertion, changes in breathing are clearly expressed. With light work, the exchange of gases increases by 2-3 times, with heavy work - by 20-30 times. A person who is not involved in sports makes 14-18 breaths per minute. When playing tennis, this figure can be 30-40. With significant physical exertion, pulmonary ventilation increases, resulting in an increase in the penetration of oxygen into the blood. At the same time, more oxygen is used from each liter of inhaled air (4-6%) than at rest (3-4%). As the load increases, so does the rate of blood flow. So, at rest, 4-5 liters of blood passes through the heart in 1 minute. But when playing tennis, it is capable of pumping up to 35 liters of blood per minute. The heart rate (HR) also has a great influence on blood circulation . At rest, the heart rate ranges from 50 to 80 beats / min, with a load it increases significantly. So, for tennis players, during warm-up, the heart rate is 120-140 beats / min, after serving with access to the net and a short draw of a point - 150-170 beats / min. The given examples show that the load of tennis players-athletes during competitions and training sessions is quite large. It is accompanied by high pulse rates. Regular tennis not only strengthens the respiratory, cardiovascular and muscular systems, but also allows you to become a real athlete. Therefore, the best tennis players are distinguished by lightning-fast reaction, dexterity of movements, resilience in defense and attack, quick thinking, the ability to find witty and unexpected tactical decisions in a split second, high performance, excellent speed, endurance and many other qualities.

Tennis not only allows you to spend your leisure time in an interesting, varied, exciting way, but also helps to improve your health. Under the supervision of a physician, it can be recommended as an adjunct to medical treatment even for patients suffering from the most common cardiovascular diseases - atherosclerosis and hypertension in the initial stage of their development. At the same time, it should be remembered that the duration and intensity of classes should be strictly regulated by the attending physician, taking into account the age, clinical manifestations of the disease and the individual characteristics of the patient's body. An excessive dose of tennis, however, like any other medicine, can cause irreparable harm to health. Many are concerned about the problem of excess body weight. In 9 out of 10 cases, according to doctors, obesity is the result of malnutrition, overeating and lack of physical activity. Tennis can become a reliable ally of those who have decided to get rid of extra pounds. Of course, you should not think that it is enough to play a couple of sets of tennis in order to immediately part with those extra pounds. However, systematic training on the court, a diet, a complete cessation of smoking and alcoholic beverages, especially beer, plus an orderly work and rest regimen will certainly help to reduce and further maintain body weight within normal limits. Undoubtedly, for stable results, a diet and an active motor regimen must be followed without violation for many years, and sometimes for a lifetime. This is a more reliable way than swallowing all kinds of diet pills. Dosed and systematic tennis lessons are of great benefit, but, of course, everything must be approached reasonably and tennis cannot be considered a panacea for all ailments. There are a number of diseases in which tennis is contraindicated and can cause irreparable harm to the body. For example, people suffering from acute forms of diseases, inflammatory processes, as well as bone damage and some diseases of the nervous system, run, and therefore play tennis is contraindicated. Therefore, before buying a racket and putting on tennis shoes, it is necessary to consult with your doctor, because the reaction of the body to tennis lessons can be different for different people with the same intensity of exercise. You can start exercising on your own or in subscription health groups. Naturally, in order to know your physical capabilities, you must undergo a medical examination at the place of residence. The coach needs to present a health certificate, and when doing independent exercises, it is important to know how much and with what intensity you can play tennis.

CONCLUSION. It's never too late to learn how to play tennis. Middle-aged and elderly people are advised to use tennis to support health, performance, and good spirits. But you should not strive for the highest achievements in the game. Do not forget that tennis is characterized by a variety of, often choppy movements, jerks, rhythm disturbances. And all this can be traumatic for people whose tissues do not already have youthful elasticity. Tennis is also remarkable in that each person can play and move around the court with intensity corresponding to his well-being and physical fitness. After all, physical activity in tennis has an interval

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character. Its intensity is reduced due to the numerous pauses in the game. These pauses occur at the end of the rally of each ball (picking up balls after the rally, changing sides when the athlete passes, transitions when serving and receiving, and so on). They are important for restoring "stray" breathing. When playing with four players, such respite increases. Those involved in tennis, by their own experience and example, are convinced of the beneficial effects of tennis on health. Vitality increases, blood circulation and metabolism increase, breathing becomes even and deeper, the heart works better, motor skills improve, muscles develop. Headaches, loss of sleep and appetite, lethargy, fatigue are a thing of the past.

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