

Physiological Reaction of the Body of Students to Regular Physical Activity

Svetlana Yuryevna Zavalishina*, Vladimir Yurevich Karpov, Olga Gennadievna Rysakova, Inessa Albertovna Rodionova, Natalia Gennadievna Pryanikova, Alexander Mikhailovich Shulgin

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Abstract

For the long-term preservation of the optimal physical status of a person, regular physical activity is required. Rational muscle activity can stimulate the entire body. It increases oxygen consumption and accelerates the release of toxic products, stimulates metabolism and protein synthesis. Frequent feasible physical training inhibits the development of pathological changes in the nervous system and internal organs. Systematic physical training has a strong healing effect on the musculoskeletal system and activates the entire endocrine system. With regular exercise, blood and venous pressure are normalized and lymph circulation is enhanced. Physical activity normalizes the processes of humoral regulation in all body systems. The most pronounced positive effect develops in the case of a combination of feasible exercises that stimulate different muscle regions. This leads to the activation of biosynthetic processes in all cells of the body. Regular dosed physical activity with optimal nutrition and sufficient sleep has a strong stimulating effect on physical capabilities and mental performance.

Keywords: Physical exercise, Muscle activity, Functional activity, Modern society

Introduction

In modern society, young people are increasingly experiencing a deficit in motor activity (Belan & Sadchikova, 2018). In this regard, to preserve the health of young people, their general muscle activity should be massively increased (Bespalov *et al.*, 2018a; Algahtani, 2020; Alzaid *et al.*, 2020; Ren-Zhang, *et al.*, 2020). The

Svetlana Yuryevna Zavalishina*, **Vladimir Yurevich Karpov**, **Olga Gennadievna Rysakova**
Faculty of Physical Education, Russian State Social University, 129226, Moscow, Russia.

Inessa Albertovna Rodionova

Department of Physical Education, Moscow State Technical University of Civil Aviation, 125993, Moscow, Russia.

Natalia Gennadievna Pryanikova

Department of Adaptology and Sports Training, Moscow City Teacher Training University, 129226, Moscow, Russia.

Alexander Mikhailovich Shulgin

Department of Physical Education, Sechenov First Moscow State Medical University, 119991, Moscow, Russia.

*E-mail: ilmedv1@yandex.ru

danger of physical inactivity is associated with the possibility of life shortening. This has been repeatedly confirmed under experimental conditions by the accelerated development in physically inactive animals of signs of early aging throughout the body with a significant increase in biological age (Larina *et al.*, 2019; Karpov *et al.*, 2020). In the case of long-term preservation at a low level of motor activity, energy processes in the heart are disrupted with a weakening of its contractile function, the manifestation of signs of stagnation in the liver and lungs, a decrease in the formation of hormones, the formation of dysfunctions in many nerve centers and a decrease in the general resistance of the body against all negative environmental factors (Amelina & Medvedev, 2009; Makhov & Medvedev, 2018b).

Systematic active muscular activity has a pronounced activating effect on the human body (Mal *et al.*, 2018b). It intensifies the assimilation of oxygen, activates the neutralization of toxic substances, and stimulates all types of metabolism (Medvedev, 2018a; Oshurkova & Medvedev, 2018a). In this regard, at all stages of ontogenesis, it is necessary to regularly perform physical exercises (Skoryatina & Medvedev, 2019), which provide a stable healing effect in all organ systems (Bespalov *et al.*, 2018b; Mal *et al.*, 2020).

To achieve the most pronounced recovery from regular physical activity, muscle load should be correctly dosed. It is imperative to take into account the initial level of fitness, the dynamics of the functional status of each young person, and changes in the general state of health against the background of stress. The purpose of this work was to assess the severity of the health-improving reactions of the human body to systematic dosed muscle loads.

Materials and Methods

The material for this work was the sources of information contained in the public domain. The search was carried out in the database of the scientific electronic library eLIBRARY.RU and the Scopus database. The research methods in this work were the methods of analysis and synthesis, induction and deduction, and the method of mathematical processing using standard statistical programs.

Results and Discussion

A low degree of fitness in conditions of refusal from systematic physical education leads to negative changes in metabolism



(Boldov *et al.*, 2018). The resulting negative changes in fat metabolism are very functionally significant (Galkin *et al.*, 2010). For many people with physical inactivity, already at a young age, an increased level of cholesterol in the blood is characteristic. This is an important "risk factor" for the formation of cardiovascular pathology in them. In the context of continuing to maintain low physical activity, the risk of cardiac pathology increases significantly (Karpov *et al.*, 2018).

Systematic feasible muscular activity leads to activation of pulmonary ventilation, stimulation of the heart, increased blood supply to all organs with the satisfaction of the needs of cells in oxygen, and a pronounced intensification of the synthesis of proteins (Arova *et al.*, 2018; Glagoleva & Medvedev, 2020).

An essential indicator of the optimization of metabolism in all organs against the background of physical training is the normalization of body weight. Elimination of excess mass occurs primarily by reducing the volume of adipose tissue in the body. This ensures the growth of working capacity and general improvement of the whole organism (Komyak, 2015).

Against the background of regular physical training, the oxygen demand of the whole body increases sharply. In this regard, the more actively all groups of skeletal muscles work, the more efficiently and more economically the heart muscle functions (Oshurkova & Medvedev, 2018b). Its activity increases as the level of general fitness increases. In athletes, the systole of the heart has a high power, which ensures the ejection of a large volume of blood into the aorta with each heartbeat. At the same time, a trained heart under conditions of significant physical exertion slightly increases its rhythm and quickly restores it after any work (Makhov & Medvedev, 2018d).

Systematic feasible muscular loads prevent the occurrence of cardiovascular diseases. They increase the level of high-density lipoprotein cholesterol in the blood and lower the level of low-density lipoprotein cholesterol and the number of triglycerides (Selkov, 2019). This situation significantly increases the elasticity of blood vessels and reduces the risk of atherosclerosis progression and the appearance of its clinical manifestations in the future (Medvedev, 2018b; Glamazdin *et al.*, 2021). These effects are an effective basis for the prevention of cardiovascular disorders, contributing to the prolongation of human life (Makhov & Medvedev, 2020b).

An extreme physiologically significant consequence of regular physical exertion on the body at a young age is the optimization of the entire vascular system (Georgievna *et al.*, 2020). Under these conditions, the functioning of the circulatory system is greatly facilitated and economized. Systematic physical activity leads to the growth of new vessels in the skeletal and cardiac muscle tissue, stimulating their blood supply (Makhov & Medvedev, 2018c). The weakening of blood coagulation and platelet aggregation occurring under these conditions additionally facilitates blood circulation throughout the body (Zaitsev *et al.*, 2018).

Under conditions of regular muscular exertion, arterial and venous blood flow is normalized, and lymph flow is intensified (Medvedev, 2018c). For this reason, an increase in motor activity, which increases the level of physical fitness, is a very effective means of preventing many types of pathology (Pham & Tran, 2019). This is because systematic physical activity significantly inhibits atrophy in all parts of the body. Muscle loads are very effective in this regard, enhancing aerobic processes under conditions of muscular work and activating the synthesis of adenosine triphosphate (Stepanova *et al.*, 2018).

Intense muscular activity has a strikingly positive effect on the functioning of the entire nervous system (Mal *et al.*, 2018a; Makhov & Medvedev, 2020a). Under these conditions, the functional activity of the nerve centers increases significantly, and disturbances in the implementation of any movements are minimized. Positive changes also occur in the general emotional background of the trainees. Their state of health, sleep, and mood normalize, the feeling of fatigue is eliminated, the ability for mental activity increases (Zhukova, 2010; Vatikov *et al.*, 2019).

Exercise has a serious stimulating effect on the respiratory organs. Against their background, the vital capacity of the lungs rapidly increases, the elasticity of the costal cartilage increases, the respiratory muscles are strengthened and their tone is optimized (Makhov & Medvedev, 2020b). Under these conditions, swimming, running, skiing to a comparable degree increase the overall efficiency of gas exchange in the lungs (Makhov & Medvedev, 2018a).

Intense physical activity, especially at a young age, provides a stimulating effect on the digestive capacity of the stomach and intestines. Regular, feasible physical activity stimulates the digestive glands and increases the absorption of nutrients. As a result of physical training, the peristalsis of the entire gastrointestinal tract increases, due to the strengthening of its smooth muscles, as well as due to hypertrophy of the muscles of the anterior abdominal wall (Vorobyeva & Medvedev, 2018). In these conditions, the risk of constipation is excluded.

Regular feasible muscular activity stimulates the work of the organs of the excretory system (Vorobyeva & Medvedev, 2019). It enhances blood supply, anabolic, and reparative processes in them. In this regard, it can be considered that physical activity facilitates the removal of various toxins from the body. In addition, under conditions of intense physical activity, the intensifying work of the endocrine system optimizes the processes of humoral regulation of all organs (Nesreen & Heba, 2019).

Regular muscle training increases joint mobility, strengthens bone tissue, delays the development of osteoporosis, prevents the occurrence of fractures, and also eliminates social loneliness by including an athlete in the company of like-minded people (Medvedev, 2018d; Misyuk *et al.*, 2019).

Conclusion

Systematic muscle training has a powerful stimulating effect on the body. Against their background, oxygen consumption increases and the neutralization of toxic substances intensifies, all types of metabolism and the synthesis of adenosine triphosphoric acid are activated. Frequent feasible physical training, especially at a young age, has a complex stimulating effect on all body systems. With their help, it is possible to slow down any developed pathology in the internal organs. Systematic physical education has a vivid normalizing effect on the work of the heart, central nervous system, and endocrine glands. As a result of regular muscle exercise, blood pressure, microcirculation, and lymph circulation are optimized. Muscle loads normalize all regulatory processes in the body. This is most clearly manifested in the case of a rational combination of different exercise options. When performing physical activity, special attention should be paid to strict adherence to the norms of a balanced diet, sufficient duration of sleep, and a competent alternation of physical activity and rest. This will help maintain general physical activity and the health of all organ systems for many years.

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