

The Effect Of Multi-Year Sports Training On The Functional Status Of The Cardiovascular System Of Athletes

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Abstract: The effect of long-term sports training on the functional state of the cardiovascular system of young athletes and the mechanisms controlling the body's adaptation to various physical loads and stress factors during sports training are given.

Key words: Heart, cardiovascular system, functional state, sports, sports training, athletes, physical load, stress, adaptation.

Introduction. In recent years, in our republic, special attention has been paid to the development of comprehensive measures and the implementation of the achieved positive results in the research of the impact of the level of movement activity on the physical development and vegetative indicators of student athletes. In this regard, in the Arolba region of our country, specific results are being achieved in terms of adaptation of the body of student athletes to the adverse environmental factors of the external environment and improvement of physical development indicators. In the Strategy of Actions for the further development of the Republic of Uzbekistan, tasks on "... mitigating the negative effects of global climate changes and the destruction of the Aral Sea" have been defined[1]. Based on these tasks, mutual comparison of the indicators of morphofunctional and physical development of students of the higher education institution of the Republic of Karakalpakstan related to the environment acquires actual scientific and practical importance.

Currently, one of the most important tasks of normal physiology is to maintain and strengthen the health of the population, especially the young generation, and maintain high professional performance of athletes. Placing the health care problem in society among the priority tasks of social development determines the relevance of its theoretical and practical development, the need to conduct relevant scientific research and develop methodological and organizational approaches to health care, formation and development. At the same time, the deterioration of social and environmental conditions in our country has a strong impact on the health of the young generation, which is an objective indicator of the environment [3].

During sports training, there are constant changes in the mechanisms that control the body's adaptation to various physical loads and stress factors, which requires accurate, fast and "sensitive" diagnostic methods to evaluate the functional state in training dynamics, competitive and recovery processes. does [2].

The concept of a common functional state is based on the close connection with each other with the main directive (control) systems. Thus, the central nervous system, together with the endocrine and immune systems, regulates the functional activity of the entire organism. The autonomic nervous system, which provides adaptive control, is mainly defined as the efficiency and result of the directive systems of the athlete's body.

It is known that the effect of stress factors on the body depends on the functional state of the autonomic nervous system. When the vegetative control system is properly developed, the expected result of the stress effect is eustress, which in turn increases the functional reserves and ensures a new, higher level of functioning of the adaptive systems. Adaptive changes in control systems are determined by the efficiency of saving and mobilizing functions during rest and physical exercise processes, thus providing variability or flexibility of control depending on the recommended background conditions [5].

As you know, the whole-organism control system model is based on the well-studied mechanisms of sinus node control of the heart. Consists of two main sections: autonomous and central. The autonomic part of the control system includes the cells of the sinus node of the heart, as well as the parasympathetic part of the autonomic (peripheral) nervous system. The central department is the management of the internal system, provides hormonal and vegetative homeostasis, as well as the interaction of the organism with the external environment.

Thus, the assessment of the performance of each section of the management system allows to comprehensively determine the state of adaptation and reserves, both currently and prognostically. One of the widely studied and used methods for the diagnosis of control processes is the recording of heart rhythm variability. Assessment of various physiological indicators and their interrelationship are used to develop algorithms for prenatal monitoring. The optimal method means the minimum of the mathematical expectation of expenditure or the minimum of the probability of misclassification. The result of the discriminant analysis is a statistical model expressed by a set of linear discriminant functions that define the decision-making limits in favor of a certain group (class) [4].

In order to analyze the results of monitoring the physical fitness and functional condition of student-athletes, students were divided into two subgroups. Each subgroup is characterized by different compensatory-adaptive reactions and different effectiveness of forming basic physical qualities.

Balanced activity of the sympathetic and parasympathetic parts of the autonomic nervous system at all stages of observation of student athletes ("adaptive state") or after many years of training reduces the centralization of the mechanisms of autonomous control of heart rhythm. Accordingly, regular physical fitness was high and above average, and no decline was observed. If the level of general physical fitness is average and below average, then in the first year of training, a significant increase in basic physical qualities is observed. Also, most of the students of this small group develop in harmony with each other from a physical point of view. In the second group of students who don't do sports ("state of functional stress"), there is a significant increase in sympathetic effects and centralization of mechanisms of autonomic control of heart rate at all stages of observation [5,6]. The level of general physical fitness will have negative dynamics until the end of the first year.

The effectiveness and speed of activation of the control systems should determine the physical training regime, taking into account the duration of the development period, the main training and the recovery period. The obtained results are adequate and consistent with the results in the relevant literature. In the process of adaptation to physical stress, the response of the adrenergic system to standard physical activity decreases. It depends on the more efficient functioning of the central neurogenic communication of adaptive control in the organism.

Special attention should be given to students in planning physical exercises. In young men with satisfactory adaptation, both at rest and in the orthostatic test, there is a significant shift in autonomic homeostasis towards the predominance of parasympathetic effects, which is reflected in a decrease in the stress index, metabolism and heart rate. In students who are satisfactorily adapted to the development of movement characteristics, the level of physical fitness is determined by: high speed and strength, endurance. The characteristics of the heart rhythm and the results of physical training tests (endurance, speed and strength tests) are important for evaluating and forecasting the effectiveness of physical training of students.

Conclusion. Thus, the variability of the heart rhythm under the influence of orthostatic allows to more accurately determine the coordination of the work of the sympathetic and parasympathetic divisions of the VNT, as well as the interaction of the central control chain and central hemodynamics. In contrast to hemodynamic indicators, it allows to more accurately determine the interaction with regulation. By analyzing heart rate variability and central hemodynamics, it allows monitoring the functional state of the athlete's body.

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