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THE RELATIONSHIP OF SPORTS TRAINING AND THE FUNCTIONAL STATE OF THE AUTOMOTIVE NERVOUS SYSTEM**Doniyorov B.B.***Sports school specialized in athletics and sports, Samarkand, Uzbekistan***Mavlyanova Z.F., Burkhanova G.L.***Samarkand state medical university, Uzbekistan***Abstract**

The article presents a review of the literature highlighting the influence of sports training on the functional state of the nervous system, which ensures the regulation of heart rate and other indicators, and related changes.

Keywords

autonomic nervous system, sports training, heart rate variability, sympathetic division, parasympathetic division

The organization of the autonomic nervous system (ANS) is not only present in humans and vertebrates. The term "vegetative" was introduced by scientists based on the fact that this complex mechanism consisting of neural circuits is characteristic of primitive organisms and regulates the elementary processes of their vital activity. The English physiologists called the autonomic nervous system autonomous because its functions cannot be consciously controlled or terminated. In fact, in mammals, including humans, it is responsible for several vital biological processes [1,2].

If we consider the vegetative system from an anatomical point of view, it can be conditionally divided into two subsystems: sympathetic (SNS) and parasympathetic (PNS). Their efferent pathways are based on the serial connection of neurons coming from the central nervous system (CNS). The anatomical differences between the sympathetic and parasympathetic nervous systems lie in the location of the neuronal cell bodies - those belonging to the SNS are located in the spinal cord of the thoracic and lumbar vertebrae, while those belonging to the PNS are divided into one group. The second nerve chain is located outside the central nervous system and forms ganglia near the spinal cord [3,4].

In sports medicine, the autonomic nervous system is of particular interest because it is directly related to athletic performance. [5-7]. Many studies have focused on heart rate variability (Figure 1), which is directly regulated by the autonomic nervous system [8-10].

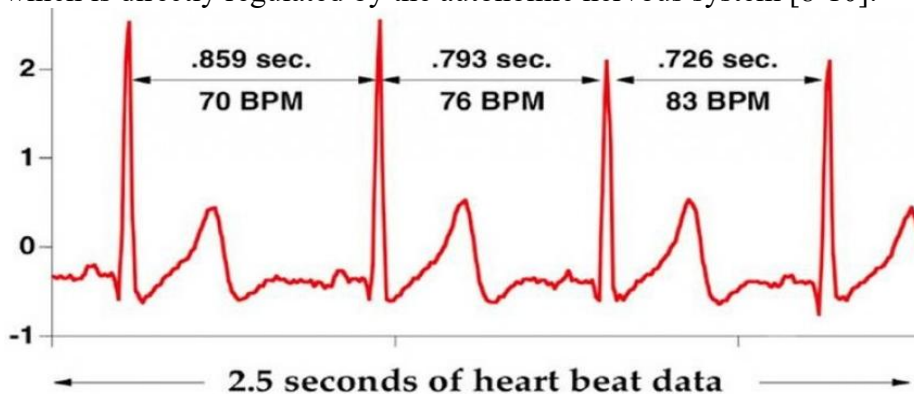


Fig.1. Heart rate variability

The main modulating influence on heart rhythm is exerted by the parasympathetic and sympathetic divisions of the autonomic nervous system. The study of heart rate variability allows us to assess the general functional state and adaptive reserves of the body, to characterize the sympathetic-parasympathetic balance of the parts of the autonomic nervous system [11].

Under the influence of sports training, the functional state of the autonomic nervous system changes [12]. In athletes at rest there is a pronounced predominance of the tone of the parasympathetic department. This is manifested by a slowdown in heart rate, lowering blood pressure, decreased breathing, etc., which ensures economization of the activities of body systems [13,14.]. During training or immediately after it, the tone of the sympathetic department predominates, which contributes to the development of adaptive reactions of the body [15].

With increasing training, there is also an improvement in motor and autonomic functions, and the establishment of an optimal balance between them [16-17,19]. Moreover, as already described above, changes in the activity of the autonomic nervous system are manifested in an increase in the predominance of the tone of its parasympathetic department (manifested in a decrease in heart rate at rest after performing a standard load, in a relative increase in skin temperature, etc.), in faster recovery autonomic functions after work and in reducing the degree of heterochronism in the restoration of both motor and autonomic functions [13,14,20]. It should be noted that among athletes training for endurance, there are no significant differences in the state of the autonomic nervous system depending on the type of sport [5,18,23].

Thus, under the influence of long-term, systematic, rational training sessions, the functional state of the autonomic nervous system changes. In athletes who train the quality of endurance, at rest there is a pronounced predominance of the tone of the parasympathetic department of the autonomic nervous system. This is manifested by a decrease in heart rate, a decrease in blood pressure, and a decrease in respiratory rate, which ensures the efficiency of the cardiorespiratory system at rest. During training, athletes experience a pronounced predominance of the tone of the sympathetic division of the autonomic nervous system, which contributes to better adaptation of athletes. With a well-planned training cycle, the autonomic nervous system works in a balanced manner. But if the parasympathetic system does not cope with the tasks of recovery due to overload, then the athlete becomes overtrained.

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