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Evaluation of Some Indicators of the Cardiovascular System Under Conditions of Physical Exertion

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ABSTRACT

During the training process, adaptive changes occur in the athletes' bodies, which contribute to increasing the body's resistance, aimed at adapting to physical exertion. Heart rate variability (HRV) regulation parameters are among the key indicators reflecting the adaptive capacity of the human body. The objective of this study was to evaluate the impact of physical exertion and the orthostatic test on the functional state of the cardiovascular and autonomic nervous systems in student athletes engaged in different types of sports (cyclic and acyclic), through a combined analysis of heart rate and adaptation indicators. Research tasks are:

- To investigate the changes in heart rate parameters among student athletes engaged in different types of sports.
- To analyze the results of the orthostatic test and the Ruffier (Bruha) step test in order to evaluate the adaptive response of the organism.
- To compare the characteristics of autonomic nervous regulation in athletes practicing cyclic and acyclic sports disciplines.

The cardiovascular parameters studied in athletes engaged in cyclic and acyclic sports revealed diverse changes under the influence of physical exertion induced by the orthostatic test and the Ruffier (Bruha) step test. The results indicated that, in most participants, the regulation of the autonomic nervous system (ANS) remained relatively stable, with a certain balance observed between the sympathetic and parasympathetic divisions. However, in athletes involved in acyclic sports, a predominance of sympathetic activity was detected, suggesting signs of physiological overstrain and a possible reduction in adaptive reserves.

Keywords: heart rate, nervous system balance, adaptation, regulation, physical activity

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