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BOOK OF ABSTRACTS

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Assessment of cardiac tolerance indicators when performing situational practical tasks

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Performing situational practical tasks (SPT) on phantoms and using specialized virtual reality training equipment by persons, whose future professional activity is associated with increased nervous and physical pressure, is accompanied by psycho-emotional stress. It could cause significant burden on the cardiovascular system. Analysis of changes in ECG parameters can assess the ability to tolerate psycho-emotional stress and detect pre-medical disorders.

83 healthy men with average age 21.7 years (95% CI 21.2–22.2) are voluntarily participated in the study. Physiological changes in the heart during psycho-emotional stress are reflected in the indicators of electrocardiographic monitoring (heart rate and amplitude of P and T peaks). Baseline monitoring data were collected using a portable ECG recorder (model 06000.1) immediately before and immediately after SPT. Statistical analysis of the generated related samples was performed using MedStat and JASP.

In the vast majority ($n=61$, 73.5%) of the 83 persons, heart rate decreased or remained unchanged, which may indicate relative calm during the SPT. In 5 people (6%) heart rate increased by 7–12 bpm. The response of cardiovascular system to training load is characterized by statistically significant ($p=0.025$) increase in T peak amplitude, decrease in P peak amplitude ($p<0.001$) and decrease in heart rate ($p<0.001$) during measurements before and after SPT. The difference between the mean values (MD) of heart rate “Before” and “After” gives 3.8 (MD 95% CI 2.3–5.4). Heart rate is an integer, but the tenth fraction of heart rate is given for reference. The difference between the mean values of P peak “Before” and “After” gives 15 mV (MD 95% CI 7–23 mV). The differences between the mean values of T peak “Before” and “After” gives 25 mV (MD 95% CI of 3–47 mV).

Analysis of ECG parameters, which are typical for the results of physical exercise tests, shows a high level of psycho-emotional load and nervous excitement at the stage of waiting for the SPT start, maximum mobilization afterward and focused calm during the SPT itself. Immediately after completing the SPT we have observed the relaxation and cardiac parameters rapid recovery.