

Psychophysiological predictors of effective adaptation to the allostatic load of the mountain climbers

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Motivation and Aim: A study of phenotypic characteristics of human adaptation to extreme factors of the external environment (such as, for example, hypoxia) represents the actual task and allows identifying the predictors of the organism's successful functioning [1]. It was found that the result of adaptation depends not only on the functional abilities of the organism and allostatic changes [2], but also on the volitional and personal characteristics of the subjects. Of particular interest is the study of human cognitive functions in the course of such adaptations [3]. It is shown that due to strong-willed qualities people can overcome physiological ailments [4] or to carry out excessive physical loading, in particular, at high-mountain ascents. The authors investigated the handedness, the reserves of the cardiovascular system and the features of sensorimotor integration in mountain climbers as possible predictors of adaptation to extreme factors of the external environment.

Methods and Algorithms: At qualified mountain climbers taking into account proficiency and age difficult sensorimotor reaction (go/no-go at normoxia and normobaric hypoxia) was studied, assessment of handedness and indicators of orthostatic test (A. Rifting's technique) were carried out.

Results: Stability of sensorimotor integration in climbers under hypoxia is higher than in normoxia. The correlation between the results of the shoulder test (handedness test) and the assessment of the cardiovascular system's reserves obtained on the basis of orthostatic indicators (reserves higher for left-side preferences) is shown.

Conclusion: The relation of the regulation of the autonomic nervous system with left-handers, resulting in more effective adaptation to the high altitude and the possibility of using handedness as a phenotypic predictor of the level of reserves of the climbers' cardiovascular system. It is suggested that the factor of hypoxia in climbers in certain conditions has a stimulating effect on the processes of sensorimotor integration.

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