

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Behaviour, Performance and Psychosocial Issues in Space (1)

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STUDY OF INTERRELATIONS OF A FUNCTIONAL INTRA-GROUP "LEADER-SLAVE" ROLE
AND LEVEL OF STRESS-RESISTANCE WITH DYNAMICS OF NEUROENDOCRINE STATUS IN
THE CONDITIONS OF LONG-TERM CONFINEMENT**Abstract**

The complex analysis of psychological and neuroendocrine data obtained in experiment with 105-day confinement (1-st stage of project "Mars-500") and participation of 6 healthy male-volunteers aged 25-40 years was performed. The aim of study was to research interrelations of a functional intra-group "leader - slave" role and level of stress-resistance with dynamics of neuroendocrine status in conditions of long-term confinement. The correlations between neurohumoral regulation and leadership level were found. During confinement the subjects with higher level of instrumental leadership activity in comparison with others were characterized by higher level of basal metabolism which was accompanied by increased insulin and more intensive exchange of carbohydrates, as well as by lower stress level and probably higher sodium body content. Higher concentration of testosterone in instrumental leaders, as compared with other groups, confirms the role of this male sex hormone which provides the short reaction time, muscular strength and qualitative characteristics of human activity. Ratio of C-peptide, cortisol and growth hormone testifies about domination of parasympathotonia and vagoinular mechanisms of neuroendocrine regulation in leaders. That could be realized in their relatively unworried state and more rational energy exchange during personal activity. We compared hormonal parameters of participants according to their stress-resistance level as measured by the capacity to manage own emotional state. Higher concentration of estradiol and neuronspecific enolase (NSE) in blood together with lower concentration of thyroid stimulating hormone (TSH) was found in subjects with higher stress-resistance level in comparison with subjects having lower stress-resistance level. The lowest levels of follicle stimulating hormone, free thyroxine and testosterone were found in subjects with middle stress-resistance level. The significant correlations between stress-resistance level and hormonal concentrations in blood were observed, positive for estradiol and NSE, and negative – for TSH. The received results give a basis to suppose that higher stress-resistance is accompanied, from one hand, by higher activity of biochemical reactions in brain structures, and from the other hand, by lower level of basic metabolism. As a whole, results of research help to understand the realizing mechanisms of patterns of psychophysiological and neurohumoral reactions in subjects with the different hierarchical intra-group status, functional role and level of stress-resistance.