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THE INFLUENCE OF THE LONG-TERM SPACE FLIGHT FACTORS ON SOME COMPONENTS OF
THE HUMAN INNATE IMMUNITY SYSTEM.

Abstract

It's well known that during the long-term space flight (SF) the immune system is exposed to adverse environmental influences, which reduces the protective capability of the human organism and may become a significant obstacle to increase the duration of the space expeditions. First of all, these changes directly affect on the innate immunity. In order to clarify the nature and severity of such changes in the system of natural resistance of the cosmonauts was assessed a number of key parameters characterizing the condition of cells of the innate immunity, such as the expression signal pattern recognition receptors , with the surface (TLR1, TLR2, TLR4, TLR5, TLR6) and cytoplasmic localization (TLR3,TLR8, TLR9). During the experiment were examined six cosmonauts, who made a long-term SF on international space station (ISS). It was shown that the on the first and on the seventh days after the completion of the long-term SF, there is a slight decrease in the content of monocytes and granulocytes that expressed on their membrane TLR1 and TLR5. At the same time, the number of monocytes and granulocytes expressing on their surface TLR2, TLR4, TLR6 on the first day after long-duration space expeditions, slightly elevated compared to background values, gradually stabilizing to the seventh day. Among monocytes and granulocytes that expressed the signal image-sensing receptors with cytoplasmic localization, the strongest changes occur in the subpopulation of TLR3 and TLR8 positive cells, at the same time the number of monocytes and granulocytes that expressed TLR9, had a less significant character. Simultaneously with the assessment of the content of monocytes and granulocytes that expressed on their surface TLR was performed to measure the main ligands of TLR - heat shock proteins HSP70, HSP60 and high-mobility group protein B1 (HMGB1). It is shown that on the first day after landing there has been a rise of these ligands, gradually returning on the seventh day to the background values. The work is supported by RFBR grant 14-04-31446