IMMUNE RESPONSE TO 60-DAY HEAD-DOWN BED REST

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Introduction: Exposure of humans to spaceflight has resulted in disregulation of the immune system. Head-down bed rest (HDBR) has been extensively used as an earth-bound analog to study physiologic effects mimicking those occurring in weightlessness during spaceflight. It is uncertain how a prolonged period of bed rest affect human immune responses. The objective of this study was to investigate the effects of 60-day HDBR on immune function and EB virus reactivation in seven male volunteers. Methods: There were seven healthy male volunteers who were subjected to HDBR for 60d. Immunological parameters including leukocyte subset distribution, lymphocyte proliferation to mitogens, secreted cytokine profiles and EB virus reactivation were monitored. Results: Total WBC counts increased significantly 10d post-HDBR as compared with pre-HDBR. At the same time, the relative percentage of neutrophils was also higher than pre-HDBR but not significant. MFI of CD11b in neutrophils was reduced obviously at the end of HDBR. T Lymphocyte proliferations to PHA reduced at HDBR 30, HDBR 60 and 10d post-HDBR while IL-2 production decreased significantly at the same time. IFN- and IL-4 production trended to decrease at HDBR 30 and HDBR 60. The relative
percentage of T lymphocyte subset, B lymphocyte and NK cells were not altered. EBV EA (early antigen) were negative and EBV VCA titers had no changes through HDBR. Conclusion: The results indicate that several immunological parameters (mainly cellular immunity) are altered significantly by prolonged HDBR, and these changes were similar to those happened in spaceflight.