Investigation of Humoral and Cellular Immunity in the Air Force Pilots of Islamic Republic of Iran

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Aim: Aviation can be a stressful environment the human beings. The pilots can suffer from great anxiety during air travels. Apart from stress, microgravity, cosmic radiations and low oxygen pressure in high altitude, can affect the physiological systems of human body, especially the immune system. The purpose of this study is to investigate different parts of the immune system in the air force pilots.

Materials & Methods: Twenty pilots were asked to complete a questionnaire and their blood sample was collected. The collected samples were examined for white blood cell count and differential by hematology analyzer; and cellular surface markers $\text{CD}_3$, $\text{CD}_4$, $\text{CD}_8$ and $\text{CD}_{56}$ using flow cytometry technique. IgM and IgG levels against herpes simplex virus 1,2 (HSV-1,2), Cytomegalovirus (CMV) and Epstein-Barr virus (EBV) were also analyzed by ELISA method. T-test was used analyze the data.

Results: The results of this study showed that peripheral blood neutrophil cells percentage, cytotoxic T cells ($\text{CD}_3^+\text{CD}_8^+$) and natural killer cells ($\text{CD}_{56}^+$), were significantly higher in the pilots compared to the control group (p<0.05). In contrary, total peripheral blood lymphocytes percentage and helper T cells ($\text{CD}_3^+\text{CD}_4^+$) were significantly lower in the pilots (p<0.05).

Conclusion: The results indicated that aviation can change pilots’ immune system, especially their cellular immunity.

Keywords: Aviation, Pilot, Immune System, Cellular Immunity, Humoral Immunity.