SPACE LIFE SCIENCES SYMPOSIUM (A1)
Human Physiology in Space (2)

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ANTHROPOMETRIC VARIATIONS AND ORTHOSTATIC STABILITY DURING SUSTAINED ACCELERATION IN A SHORT ARM HUMAN CENTRIFUGE (SAHC) AMONGST +GZ NAIVE TEST SUBJECTS: FORM INFLUENCES FUNCTION.

Abstract

Introduction The aim of this study was to determine which anthropometric factors play a significant role in maintaining orthostatic stability prior to hyper gravity +Gz exposure in a short arm human centrifuge (SAHC). Methods 20 +Gz naive test subjects, were exposed to two rounds of +2Gz in a SAHC. The G force profile followed a plan of nine phases of varying +Gz exposure. Before being exposed to +Gz, each subject completed a complete biometric profile via air-displacement plethysmography to ascertain body composition and its effects on orthostatic tolerance. Baseline cardiovascular parameters were recorded as well. Results From the 20 subjects, 10 subjects were female and 10 were male. 14 test subjects completed all 9 phases of +Gz exposure, and were therefore classified as having high +Gz tolerance. The remaining 6 subjects had their +Gz exposure terminated by the flight physician, and were therefore classified as exhibiting low +Gz tolerance. Body volume (BV) was the only significant factor (p¡0.05) that distinguished these two groups. Higher tolerant subjects' body volume was calculated to be 70.6 L 6.57, whereas lower tolerant subjects body volume was 64.42 L 3.85. Significant correlations between cardiac output (CO) and stroke volume (SV) and BV were also calculated. Discussion The results from this study provide evidence that body volume is a significant anthropometric factor that contributed to higher orthostatic stability during +Gz as increased total body volume was significantly correlated with hemodynamic parameters.