
INTRODUCTION. Nasal function is of paramount importance for aircrew. Aspecific nasal hyperreactivity (ANH) prevalence in a young I.A.F. population was investigated and compared to the prevalence of aspecific bronchial hyperreactivity (ASH) assessed by methacholine bronchial provocation test (8PT) was also performed, as well as a screening test for inhalant allergy (Phadiatop). RESULTS. The 198 aviators underwent 320 evaluations averaging 1.65 visits per subject. ANH was noted on physical exam and/or echocardiography in 53 of these aviators. Some degree of AR (mild-moderate-severe) was noted on Doppler study in 31 aviators; 25 of these 31 aviators had an ANH. The only arrhythmia significantly more common in individuals with MPH and AR was supraventricular pairs (12.7% with MPH vs. 1.3% without MPH, p < 0.01). Ventricular pairing, ventricular or atrial fibrillation/flutter etc. did not show a significant association with the MPH group. CONCLUSION. In this group of 198 aviators with MPH only an ANH was as specific to identifying aviators with MPH as are risk for tachycardias.


INTRODUCTION. Changes in blood volume during space flight are thought to contribute to decrements in cardiovascular and orthostatic function. The purpose of this study was to determine whether gender affects red cell mass and plasma volume during a short exposure to simulated microgravity, and whether gender differences in orthostatic intolerance are related to changes in blood volume. METHODS. Subjects were 105 men and 102 women (31.5 ± 5.2 yrs, STD) underwent 13 days of 6° head-down bedrest. Plasma volume (2H-labelled bromine albumin) and red cell mass (51+-labelled red blood cells) were measured before bedrest and on bedrest day 13. On the same day, orthostatic tolerance (OT) was determined as the maximal pressure during a presyncopal-limited lower body negative pressure test. RESULTS. Plasma volume (PV) and red cell mass (RCM) decreased (P < 0.01) during bedrest in both groups, with a greater PV decrease (P < 0.05) in men (6.3 ± 0.6 ml/kg) than in women (4.1 ± 0.6 ml/kg). Decreases in red cell mass were similar (1.7 ± 0.2 ml/kg in men and 1.7 ± 0.2 ml/kg in women). OT was similar for men and women before bedrest (-78 ± 2 mmHg in men vs. -70 ± 4 mmHg in women) and decreased by a similar degree (by an average of 11 mmHg in both groups) after bedrest. The changes in OT did not correlate with changes in plasma volume during bedrest (r = 0.02). CONCLUSION. Thus, although female hormones may protect PV during bedrest, they do not appear to offer an advantage in terms of loss of orthostatic function.


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THE EFFECTS OF LYSOPHUS IN HEMODYNAMIC RESPONSES TO HEAD-DOWN TILT AND ORTHOSTATIC STRESS. D. Warren* and R. W. Gorospe*, Wright State University School of Medicine, Dayton, OH 45401.

INTRODUCTION. This study was conducted to determine the effects of the synthetic drug lysine-8-vasopressin (lysoptin) on specific hemodynamic variables during nascent (4 hours) head-down tilt (HDT) and subsequent orthostatic stress. METHODS. Seven healthy male subjects, ages 23-37, participated in a blinded, crossover study of lysoptin versus the control, normal saline infusion, administered intrasinally immediately before and two hours after beginning a 6 degrees head-down tilt (HDT) plasma volume changes, cardiac output, left ventricular systolic and end-diastolic function and blood volume changes were measured by venous hemoglobin/hematocrit and radiofrequency measurements. Subjects were 12 normocytic males between the ages of 35 and 50. After an 8-10 h fast, subjects ingested Cephulac® (20g solution) with a low-tibcister breakfast on four different days (45, 30, 25, and 20) before HDT and on three separate days (4, 7, and 10) during HDT. Breath-H2 concentrations were measured before and at 10-min intervals for 4 h after breakfast using a Quintron breathalyzer, and HCT was determined from these data. RESULTS. MCTT between 50 and 100 min during ambulation and 50 and 210 min during HDT with means of 79 min and 122 min, respectively. CONCLUSIONS. Mean MCTT during HDT was 54% longer than during ambulation, suggesting that absorption and availability of orally administered medications and nutrients may be delayed or impaired as a result of decreased GEM during bedrest.

INTRODUCTION. Hindlimb denervation produces alterations in skeletal muscle and bone similar to those observed in animals exposed to microgravity. The objective of this experiment was to determine if dobutamine (a synthetic catecholamine and beta agonist), could effectively attenuate bone and muscle changes induced by 12 days of hindlimb denervation.

METHODS. Adult male Sprague-Dawley rats (n=14) underwent unilateral sciatic nerve section on the right hindlimb. After surgery rats were randomly assigned to either control saline (SAL) or DOB treatment groups. Each animal received two intraperitoneal injections per day, given approximately one hour apart, for 11 of the 12 days. These rats exhibited a 35% decrease in muscle mass (21). Cardiac function was assessed using a Multi-Wire Gamma Camera following an intravenous bolus injection of 30-50 milliliters of Technetium. Manual blood pressures and electrocardiograms were obtained throughout the 3-minute protocol. Between rest and exercise (DOB), heart rate increased (P<.001) from 67 + 3 bpm to 99 + 4 bpm, systolic blood pressure decreased (P<.001) from 119 + 3 mm Hg to 107 + 3 mm Hg and left ventricular ejection fraction (EF) decreased (P<.001) from 0.48 + 0.02 to 0.48 + 0.02. During LBNP, ST segment depression of at least 0.5 mm occurred in 7 subjects. Subjects with ST segment depression had greater reductions in heart rate and blood pressure than those without. CONCLUSION. This data indicates that DOB is able to effectively attenuate alterations in muscle and bone which are induced by hindlimb denervation. This information suggests that DOB may be effective as a countermeasure for some of the deconditioning effects which result from exposure to a microgravity environment.


At pre-syncope levels of lower body negative pressure (LBNP), we have frequently observed electrophysiologic and hemodynamic responses consistent with phase 2 of the unloading protocol. Cardiac function was assessed using a Multi-Wire Gamma Camera following an intravenous bolus injection of 30-50 milliliters of Technetium. Manual blood pressures and electrocardiograms were obtained throughout the 3-minute protocol. Between rest and exercise (DOB), heart rate increased (P<.001) from 67 + 2 bpm to 99 + 2 bpm, systolic blood pressure decreased (P<.001) from 119 + 2 mm Hg to 107 + 2 mm Hg and left ventricular ejection fraction (EF) decreased (P<.001) from 0.48 + 0.02 to 0.48 + 0.02. During LBNP, ST segment depression of at least 0.5 mm occurred in 7 subjects. Subjects with ST segment depression had greater reductions in heart rate and blood pressure than those without. CONCLUSION. This data indicates that DOB is able to effectively attenuate alterations in muscle and bone which are induced by hindlimb denervation. This information suggests that DOB may be effective as a countermeasure for some of the deconditioning effects which result from exposure to a microgravity environment.