
INTRODUCTION. Nasal function is of paramount importance for aircrew. Aspecific nasal hyperreactivity (ANH) prevalence in a young AF population was investigated and compared to the prevalence of aspecific bronchial hyperreactivity (ABH) and allergy. ABH was also associated with the lack of mouth breathing in response to naphazoline and methacholine nasal provocation tests (NPTs). ANH was evaluated by rhinomanometry and only for measuring the methacholine NPT, by measurement of nasal secretions. A methacholine bronchial provocation test (BPT) was also performed, as well as a screening test for inhalant allergy (Phadiatop). RESULTS. 25% was positive to cold water (CW), 50% to methacholine NPT and 8% to both. BPT was positive in 2/3 of cases ANH was associated with ABH to either NPTs. 24% was positive to Phadiatop and 91% in this group was positive to either NPT or BPT. CONCLUSION. ANH is more frequent than ABH, which is often associated to the former condition. Atopy seems to match very often with aspecific upper and/or lower airway hyperreactivity. Implications for selection of aircrew can follow.

BLOOD VOLUME AND ORTHOSTATIC RESPONSES OF MEN AND WOMEN TO A 13-DAY BEDREST. *S. Forney, T. Driscoll, L. Katz, L. Wright*, NASA Johnson Space Center, KRG Life Sciences, and the Baylor College of Medicine.

INTRODUCTION. Changes in blood volume during space flight are thought to contribute to deconditioning and provide a target 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 function were attributable to gender differences in fluid distribution. METHODS. Ten men (35 ± 5.2 years, STD) and eleven normally-menstruating women (33.6 ± 6.0 yrs, STD) underwent 15 days of 6° head-down bedrest. Plasma volume (3H-labelled albumin albumin) and red cell mass (51Cr-labelled red blood cells) were measured before bedrest and on bedday 13. On the same days, 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 ± 6 mmHg in men and -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 (P > 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.

THE EFFECTS OF LPYRINE ON HEMODYNAMIC RESPONSES TO HEAD-DOWN TILT AND ORTHOSTATIC STRESS. D.E. Wray* and R.W. Gotto, Jr., Wright State University School of Medicine, Dayton, OH 45401.

INTRODUCTION. This study was conducted to determine the effects of the synthetic drug l-synephrine (lypine) on specific hemodynamic variables during nascent (4 hours) head-down tilt (HDT) and subsequent orthostatic stress. METHODS. Seven healthy male subjects, ages 23-29 (mean age 26.5) were subjected to a blinded, cross-over study of lypine versus the control, normal saline intravenous (IV) administered intrasinally immediately before and two hours after beginning a 6 degree head-down tilt. Plasma volume, intravascular flow and cardiovascular dynamics were assessed with venous hemoglobin/hematocrit (Hb/Ht) measurements, cardiac output, arterial pressure and pulse pressure, electrocardiography, impedance cardiography and plethysmography measurements before, during, after tilt, and in response to a 2-minute stand test. RESULTS. In the lypine trial, stroke volume, cardiac output and intrathoracic pressure were significantly increased (p<0.05) at the end of the 6° head-down tilt. Plasma volume change showed a significant overall increase of 5.9% by the end of the tilt in the lypine trial (p<0.001) while in the placebo there was no significant change. Clinical observations included pre-syncopal sensations in three of the seven control subjects versus none of the lypine trial subjects during post-tilt stand testing. Post-tilt orthostatic changes in arterial pressure were maintained at a higher value in the lypine trial compared to baseline stand test. The pulse time index and cardiovascular index of deconditioning showed a significant increase for placebo subjects after tilt and no change from pre-tilt with lypine subjects. CONCLUSIONS. The cardiovascular system adapts to a new steady-state during 4 hours HDT that is maladaptive when provoked with orthostatic stressors. Exogenous vasopressin analogue ameliorates these deleterious effects of post-tilt stand testing by maintaining the intravascular volume at greater than pre-tilt volumes and increasing mean arterial pressure via peripheral resistance.