**MITRAL REGURGITATION AS A COFACTOR IN MITRAL VALVE PROLAPSE**

INTRODUCTION. Mitral regurgitation in the setting of mitral valve prolapse identifies a subset of individuals with eventual development of mitral valve regurgitation.

METHODS. Mitral regurgitation considered present if there was a late systolic murmur, difficultly appraised by auscultation and confirmed by maneuvers and/or color-flow/cine wave turbulence evidence for mitral regurgitation on two-dimensional echocardiography.

RESULTS. Mitral regurgitation at the initial evaluation in 198 military aviators. Mitral regurgitation was present in 11 of 31 patients with mitral valve prolapse (35.5 ± 5.2 years, STD) and eleven normally-maturing women (33 ± 6.0 y, STD) underwent 13 days of 6-h head-down bedrest. Plasma volume (% labelled hemoglobin albumin) and red cell mass (% labelled red blood cells) were measured before bedrest and on bedrest day 13. On the same day, orthostatic tolerance (OT) was determined as the maximum 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 mmHg) than in women (4.1 ± 0.6 mmHg). Decreases in red cell mass were similar (1.7 ± 0.2 mmHg in men and 1.7 ± 0.2 mmHg in women). OT was similar for men and women before bedrest (78.6 ± 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 (p = 0.02).

CONCLUSION. Although female hormones may protect against bedrest-induced anemia, they do not appear to offer an advantage in terms of loss of orthostatic function.

**ASPECIFIC NASAL HYPERREACTIVITY IN AN AIR FORCE POPULATION AND ITS RELATIONSHIP WITH BRONCHIAL HYPERREACTIVITY**

INTRODUCTION. Nasal function is of paramount importance for airflow. Aspecific nasal hyperreactivity (ANH) prevalence in a young Air Force population was investigated and compared to the prevalence of aspecific bronchial hyperreactivity (ASH) and evaluated in a hypoxic environment.

METHODS. ANH was evaluated by rhinomanometry, and only for 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, 58% to methacholine NPT and 9% to both. BPT was positive in 2/3 of cases ANH was associated with ANH 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 ANH, 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 airflow can follow.

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

INTRODUCTION. Changes in blood volume during space flight are thought to contribute to decrements in post-flight 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 present. METHODS. 13 \( (35.5 ± 5.2\) years, STD) and 11 normally-maturing women underwent 13 days of 6-h head-down bedrest. Plasma volume (% labeled hemoglobin albumin) and red cell mass (% labeled red blood cells) were measured before bedrest and on bedrest day 13. On the same day, orthostatic tolerance (OT) was determined as the maximum pressure during a presyncope 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 mmHg) than in women (4.1 ± 0.6 mmHg). Decreases in red cell mass were similar (1.7 ± 0.2 mmHg in men and 1.7 ± 0.2 mmHg in women). OT was similar for men and women before bedrest (78.6 ± 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 (p = 0.02).

CONCLUSION. Although female hormones may protect against bedrest-induced anemia, they do not appear to offer an advantage in terms of loss of orthostatic function.

**THE EFFECTS OF LYPRESSIN ON HEMODYNAMIC RESPONSES TO HEAD-DOWN TILT AND ORTHOSTATIC STRESS. D.~Wright* and W.G.~Goetzl†.**

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INTRODUCTION. This study was conducted to determine the effects of the synthetic drug lysine-8-vasopressin (lypressin) on specific hemodynamic variables during nascent (4 hours) head-down tilt (HDT) and subsequent orthostatic stress. METHODS. Seven healthy male subjects, ages 23-37, were studied once in a blinded, cross-over study of lypressin versus the control, normal saline naso-spray, administered intranasally immediately before and two hours after beginning a 6 degree head-down tilt. Plasma volume, urine flow and cardiovascular dynamics were determined by use of venous hemoglobin/hematocrit and plasma volume effects, echocardiography, impedance cardiography and plethysmography measurements before, during, after tilt, and in response to an 8-minute stand test. RESULTS. Ten men (31.5 ± 6.0 yrs, STD) underwent 320 evaluations (n=198) during HDT and subsequent post-tilt stand testing. The pulse time index and cardiovascular index of deconditioning showed pressure was maintained at a higher value in the lypressin trial compared to the control, normal saline naso-spray, administered intranasally immediately before and two hours after beginning a 6 degree head-down tilt. Plasma volume (% labeled hemoglobin albumin) and red cell mass (% labeled red blood cells) were measured before bedrest and on bedrest day 13. On the same day, orthostatic tolerance (OT) was determined as the maximum pressure during a presyncope 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 mmHg) than in women (4.1 ± 0.6 mmHg). Decreases in red cell mass were similar (1.7 ± 0.2 mmHg in men and 1.7 ± 0.2 mmHg in women). OT was similar for men and women before bedrest (78.6 ± 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 (p = 0.02).

CONCLUSION. Although female hormones may protect against bedrest-induced anemia, they do not appear to offer an advantage in terms of loss of orthostatic function.
EACH OXYGEN PULSE SHOWS HEAD-LEVEL BLOOD FLOW CYCLING DURING STEADY-STATE EXPOSURE TO +Gz: F. Buck, and J. Malcon. Defence and Civil Institute of Environmental Medicine, North York, Canada, MMM 389.

INTRODUCTION. The generally accepted +Gz time/tolerance curve (Stoll, 1951) shows a smooth and horizontal band through discrete points of tolerance up to 20 sec after the "trough". While this suggests cardiovascular steady-state, such level blood flow, head blood pressure at rest and head blood flow are known to increase and decrease with regular frequency (Wood and Lambert, 1989). If so, +Gz tolerance capacity may vary during this time. METHODS. Continuous head-level perfusion indices were obtained from measurement of ear blood flow during the acceleration phase of +Gz (wood). The measurements were obtained from 1 to 5 +Gz exposure in 50% of +Gz exposure. RESULTS. In the first 5 +Gz of +Gz exposure, ear opacity and ear opacity pulse amplitude decreased. The decrease was more marked at increased +Gz levels. Cardiovascular compensation occurred over the next 5 s which increased opacity and opacity pulse. For the remainder of the 2 min exposure, ear blood flow changed with a mean cycle period of 10.4 s. The mean difference in the ear opacity levels within cycles was 17.1% of the +Gz opacity value. CONCLUSIONS. These results suggest that severe increases in ear blood flow during cardiovascular steady-state period of sustained +Gz exposure. It follows that the physiological ability to avoid loss of consciousness may also fluctuate.

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EFFECT OF LNP ON CEREBRAL CIRCULATION

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INTRODUCTION. The purpose of our study is to determine the effects of lower body negative pressure (LNP) on cerebral circulation. LNP decreases cerebral blood flow and induces a decrease in cerebral blood volume. This decrease in cerebral blood volume may be due to an increase in cerebral venous pressure. The purpose of the study was to determine the effect of LNP on cerebral blood flow and cerebral blood volume.

METHODS. Six healthy volunteers were studied. The subjects were divided into two groups: Group A (n = 3) and Group B (n = 3). Group A was exposed to 30 mmHg LNP for 25 min by using a carotid doppler and transcranial doppler. Group B was exposed to 30 mmHg LNP for 25 min by using a carotid doppler and transcranial doppler. The mean velocity of the middle cerebral artery (MCA) and the mean blood flow of the middle cerebral artery (MCA) were measured.

RESULTS. The mean velocity of the middle cerebral artery (MCA) and the mean blood flow of the middle cerebral artery (MCA) were decreased in both groups. The decrease in mean velocity and mean blood flow was more pronounced in Group B (30 mmHg LNP) than in Group A (25 mmHg LNP). The decrease in mean velocity and mean blood flow was more pronounced in Group B (30 mmHg LNP) than in Group A (25 mmHg LNP).

CONCLUSION. The results of the study suggest that LNP decreases cerebral blood flow and cerebral blood volume. The decrease in cerebral blood flow and cerebral blood volume may be due to an increase in cerebral venous pressure. The decrease in cerebral blood flow and cerebral blood volume may be due to an increase in cerebral venous pressure.