CHANGES IN LEFT VENTRICAL FUNCTION AS DETERMINED BY THE MULTI-WIRE GAMMA CAMERA AT NEAR PRESYNCOPE LEVELS OF LOWER BODY NEGATIVE PRESSURE.

INTRODUCTION. Limit of human tolerance to +Gz acceleration is attributed to cerebral perfusion failure. A study using transcranial Doppler (TCD) was conducted in order to evaluate changes in cerebral blood flow (CBF) under +Gz stress.

METHODS. Limit of human tolerance to +Gz acceleration was assessed by transcranial Doppler recording of middle cerebral artery (MCA) blood flow velocity. Arterial pressure (heart level) was monitored by a continuous non-invasive method (Finapres 3000). From these data, mean cerebral artery perfusion pressure was computed. RESULTS. Mean brain flow velocity (MBFV) was significantly decreased during G-onset and sustained during 2 and 4 +Gz plateaus. MBFV = S.E.M. decreased from 11.5 ± 5.2 % (±Gz) to 44.5 ± 24.5 % (±Gz). Three main intolerance cases were observed: 1) severe transient extended blood flow back in MCA. DISCUSSION. The sensitivity of TCD method is adequate to evaluate small variations of CBF at ±Gz. The method shows that CBF is insufficient at certain ±Gz profiles, explaining intolerance symptoms.

EFFECT OF LBNP ON CEREBRAL CIRCULATION

INTRODUCTION. The purpose of our study is to determine the effects of lower body negative pressure (LBNP) on cerebral circulation. Method: Oxygenation and hemodynamics of the brain were measured continuously and non-invasively in eight cases who were exposed to 30 mmHg LBNP for 30 min by using a carotid doppler, a transcranial doppler, a cuanine laser doppler, and a near infrared spectrophotometry. RESULTS. The carotid blood flow and the mean velocity of the middle cerebral artery decreased in all cases except one case even though the systolic blood pressures were well maintained. Oxygenation (HbO2:SaO2) and hemoglobin and cerebral blood volume of the brain typically increased while deoxygenated hemoglobin showed variable small changes. CONCLUSION. The results of our study suggest that deoxygenated hemoglobin and cerebral blood volume, it is suggested that the dilatation of the cerebral vessels occur at the arterial side. Taken together, it can be said that exposure to moderate LBNP typically produces a decrease of the cerebral blood flow with a compensatory vasodilatation of the arteriolar side of the brain.

HEMODYNAMIC RESPONSES OF THE SWINE TO G-SUIT INFLATION, THE AG50 AND PRESSURE BREATHING DURING +Gz (PB).

INTRODUCTION. The generally accepted +Gz time/tolerance curve (Stoll, 1951) shows a smooth and horizontal trend by discrete points of tolerance up to 20 sec after the "brach". While this suggests cardiovascular steady-state, recent studies have shown that net blood flow and resistance 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 arterial pressure at heart level, head level, and at +Gz and +Gd. The advice of Dr. E.H. Wood is gratefully acknowledged.

ASSESSMENT OF CEREBRAL BLOOD FLOW BY TRANSCRANIAL DOPPLER METHOD DURING +Gz ACCELERATION IN HUMAN.

CONCLUSIONS. These results suggest that hemodynamic changes during +Gz may differ from cardiovascular steady-state period of sustained +Gz exposure. It follows that the physiological inability to allow loss of consciousness may also fluctuate.耳, the advice of Dr. E.H. Wood is gratefully acknowledged.