Peripheral arterial and venous response to tilt test after a 60-day bedrest with and without countermeasures (ES-IBREP)

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We quantified the impact of 60-day head-down bed rest (HDBR) with countermeasures on arterial and venous response to tilt. METHODS: Twenty-one males: 7 control (Con), 7 resistive vibration exercise (RVE) and 7 Chinese herb (Herb) were assessed. Subjects were identified as finisher (F) or non-finishers (NF) at the post-HDBR 20-min tilt test. The cerebral (MCA), femoral (FEM) arterial flow velocity and leg vascular resistance (FRI), the portal vein section (PV), the flow redistribution ratios (MCA/FEM; MCA/PV), the tibial (Tib), gastrocnemius (Gast), and saphenous (Saph) vein sections were measured by echography and Doppler ultrasonography. Arterial and venous parameters were measured at 3-min pre-tilt in the supine position, and at 1 min before the end of the tilt. RESULTS: At post-HDBR tilt, MCA decreased more compared with pre-HDBR tilt in the Con, RVE, and Herb groups, the MCA/FEM tended to decrease in the Con and Herb groups (not significant) but remained stable in the RVE gr. FRI dropped in the Con gr, but remained stable in the Herb gr and increased in the RVE gr. PV decreased less in the Con and Herb groups but remained unchanged in the RVE gr. MCA/PV decreased in the Con and Herb groups, but increased to a similar extent in the RVE gr. Gast section significantly increased more in the Con gr only, whereas Tib section increased more in the Con and Herb groups but not in the RVE gr. The percent change in Saph section was similar at pre- and post-HDBR tilt. CONCLUSION: In the Con gr, vasoconstriction was reduced in leg and splanchnic areas. RVE and Herb contributed to prevent the loss of vasoconstriction in both areas, but the effect of RVE was higher. RVE and Herb contributed to limit Gast distension whereas only RVE had a protective effect on the Tib.
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