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Effects of Beetroot and Hawthorn Supplementation on Blood Pressure and Prevalence of AMS in Hypoxia

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Acute Mountain Sickness (AMS) is a debilitating condition affecting travelers to altitude, noted by gastrointestinal issues, headache, and difficulty sleeping. An association has been seen between high central blood pressure and incidence of AMS, suggesting a possible causal relationship. Beetroot juice and hawthorn extract have both been shown to lower blood pressure. Beetroot can also improve endothelial function, as measured with flow mediated dilation (FMD). **PURPOSE:** To investigate the effects of two dietary supplements, beetroot juice and hawthorn extract, on blood pressure and AMS at simulated altitude. **METHODS:** 6 healthy volunteers (mean (SD): VO_{2max} : 39.6 (7.0) $ml \cdot kg^{-1} \cdot min^{-1}$) participated in a double-blind, crossover study of three groups, 1) placebo (PP), 2) beetroot juice (BP), and beetroot and hawthorn (BH), with a 10-day washout between treatments. Subjects supplemented for 7 days before spending 4 hours at simulated altitude ($\sim 12\% O_2$; $\sim 4,500$ m). Systolic blood pressure (SBP), FMD, and AMS using the Lake Louise Scoring system were assessed. **RESULTS:** Subjects had a lower incidence of AMS in the BP group (33%) compared control (50%, $p=0.73$), but this finding did not reach statistical significance. Compared to PP (123.0 (4.4) mmHg), SBP in BR was (126.5 (11.0) mmHg, $p=0.62$) and in BH was (125.3 (9.2) mmHg, $p=0.70$). FMD showed no difference in control (3.5 (2.1) %) compared to BP (3.7 (7.2) %, $p=0.98$) and BH (5.7 (7.6) %, $p=0.72$). **CONCLUSION:** Beetroot juice lowers blood pressure in normoxic conditions, but the present study failed to show this effect at simulated altitude, nor was there added benefit to hawthorn extract supplementation. The prevalence of AMS was lower in BP, an indication that this area needs more robust investigation. Dietary interventions are a viable method to stave off Acute Mountain Sickness, but future beetroot research needs to involve a larger sample size.