**Title:** The effect of acute intermittent hypoxia on the systemic vascular response to sympathetic activation in healthy men and women

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**INTRODUCTION**: Acute intermittent hypoxia (AIH) elicits an increase in sympathetic nervous activity (SNA) that persists following return to room air. This AIH-mediated sympathetic activation is associated with an increase in blood pressure in men, but not women. We examined the systemic vascular response to sympathetic activation before and after AIH in heathy young men and women. We hypothesized the vascular response to sympathetic activation would be preserved following AIH in men, and the vascular response to sympathetic activation would be attenuated in women following AIH, with the greatest effect observed when endogenous estradiol was high.

**METHODS**: 313 men (26±1 yrs), 13 naturally cycling women (25±1 yrs), and 11 women taking oral contraceptives (24±1 yrs) participated. Women were studied during late follicular or active pill phase of their menstrual cycle. Before and after 30-min AIH, a 2-min cold pressor test (CPT) was conducted to increase SNA. Blood pressure (BP, finger photoplethysmography) was measured continuously, and cardiac output (CO) and total vascular conductance (TVC) were calculated. A change in mean BP, CO, and TVC during CPT were calculated [(Baseline – CPT)/Baseline].

**RESULTS**: Mean blood pressure increased following AIH in men ($p=0.026$) with no effect in women ($p>0.050$). In all groups, the MBP (Main effect of AIH, $p<0.001$; Interaction of group and AIH, $p=0.919$) and TVC (Main effect, $p=0.004$; Interaction, $p=0.792$) responses to sympathetic activation were attenuated following AIH. There was no effect of AIH on the CO response to sympathetic activation in any group (Main effect, $p=0.454$; Interaction, $p=0.873$).

**CONCLUSION**: The MBP and TVC response to sympathetic activation is attenuated following AIH in both men and women, regardless of sex. In contrast, the CO response to sympathetic activation following AIH is preserved. Present data suggest acute adaptive responses to sympathetic activation follow IH in young healthy adults are independent of sex or hormone(s).

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