Impact of Acute Sauna on Young and Middle-Aged Populations

ARIANNA YOUNG, OLIVIA LEACH, & JAYSON GIFFORD

BYU Cardiovascular Lab; Exercise Science; Brigham Young University; Provo, UT

Category: Undergraduate

Advisor / Mentor: Gifford, Jayson (jaysongifford@byu.edu)

ABSTRACT

Sauna exposure is a common form of whole-body heating therapy. Previous studies done on the older population suggest a positive correlation between time spent in sauna and cardiovascular health. Heat stress induces changes in the vascular response, but the effects on middle-aged and young populations are unknown. PURPOSE: To determine effects of whole-body heating on vascular resistance and blood pressure in young and middle-aged populations.

METHODS: We recruited 18 individuals (10 young: 4 female, male, age = ~24.9yrs and 8 middle-aged: 4 female, 4 male, age = ~55.75yrs). Two T-type thermocouples were placed in the esophagus and vastus lateralis to measure core and intramuscular temperature. Two, 20-minute bouts of sauna were completed with blood pressure and vascular resistance measured at baseline, the 10-min break, and mins 30, 60, and 90 in the post heat recovery. Blood pressure was measured with an automated sphygmomanometer and vascular resistance was measured with doppler ultrasonography.

RESULTS: Esophageal and intramuscular temperature in both groups were significant with a main effect of time (P<0.001 for both). The middle-aged group exhibited a significant decrease in systolic blood pressure (SBP) immediately post heat (135.1 ± 17.2 mmHg at baseline to 122.4 ± 19.7 mmHg (P = 0.005)). In the middle-aged group diastolic blood pressure (DBP) exhibited a significant decrease from 81.6 ± 13.0 mmHg at baseline to 69.8 ± 8.4 mmHg (P < 0.001) following sauna. Baseline resistance in the brachial artery was 0.78 ± 0.28 mmHg⋅min⋅ml⁻¹ for the young and 1.03 ± 0.31 mmHg⋅min⋅ml⁻¹ for the middle-aged, which decreased significantly to 0.18 ± 0.05 mmHg⋅min⋅ml⁻¹ in the young and 0.16 ± 0.08 mmHg⋅min⋅ml⁻¹ in the middle-aged following heat, which continued 30 minutes post recovery (P<0.001). Baseline resistance in the superficial femoral artery was 0.49 ± 0.21 mmHg⋅min⋅ml⁻¹ in the young group and 0.48 ± 0.06 mmHg⋅min⋅ml⁻¹ in the middle-aged group. Resistance decreased significantly to 0.16 ± 0.08 mmHg⋅min⋅ml⁻¹ in the young and 0.18 ± 0.07 mmHg⋅min⋅ml⁻¹ in the middle-aged group following heat exposure.

CONCLUSION: Heat exposure appears to decrease vascular resistance in both groups, as well as blood pressure in middle-aged adults, suggesting a beneficial relationship between heat exposure and cardiovascular health.