

**Impact of Acute Sauna on Young and Middle-Aged Populations**

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**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 ( $135.1 \pm 17.2$  mmHg at baseline to  $122.4 \pm 19.7$  mmHg ( $P = 0.005$ )). In the middle-aged group diastolic blood pressure (DBP) exhibited a significant decrease from  $81.6 \pm 13.0$  mmHg at baseline to  $69.8 \pm 8.4$  mmHg ( $P < 0.001$ ) following sauna. Baseline resistance in the brachial artery was  $0.78 \pm 0.28$  mmHg·min·ml<sup>-1</sup> for the young and  $1.03 \pm 0.31$  mmHg·min·ml<sup>-1</sup> for the middle-aged, which decreased significantly to  $0.18 \pm 0.05$  mmHg·min·ml<sup>-1</sup> in the young and  $0.16 \pm 0.08$  mmHg·min·ml<sup>-1</sup> in the middle-aged following heat, which continued 30 minutes post recovery ( $P < 0.001$ ). Baseline resistance in the superficial femoral artery was  $0.49 \pm 0.21$  mmHg·min·ml<sup>-1</sup> in the young group and  $0.48 \pm 0.06$  mmHg·min·ml<sup>-1</sup> in the middle-aged group. Resistance decreased significantly to  $0.16 \pm 0.08$  mmHg·min·ml<sup>-1</sup> in the young and  $0.18 \pm 0.07$  mmHg·min·ml<sup>-1</sup> 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.