Low Intensity Exercise has Greater Acute Vascular Benefits for Reducing Arterial Stiffness in Hot Compared to Neutral Conditions

KYLEIGH ALLIE, JULIANNA KILPATRICK, PAOLO M. SALVADOR and ERIC RIVAS

1 Exercise and Thermal Integrative Physiology Laboratory, Texas Tech University, Department of Kinesiology and Sport Management, Lubbock, TX, USA

ABSTRACT

Both exercise and passive heating cause acute reductions in blood pressure. It is unknown if exercise-heat stress causes likewise reductions or greater when combined. PURPOSE: This project tested the hypothesis that the resting and exercise-heat stress cause hypotension and improvements in arterial stiffness. METHODS: Seven healthy active (7 day activity: 9887±3564 steps/day; VO2max: 52±10 mL/kg/min) subjects (5M/2F, 24±9y, 171±6cm, 68±7kg) completed a 30 min baseline rest followed by 60 min of exercise recovery. A 2-way repeated measures analysis of variance was used to examine interaction and main effects for condition x time. RESULTS: Exercise intensity was slightly greater (54±1 vs 48±3%VO2max, P<0.003) in neutral than hot conditions at an RPE of 12. Pre- and post-exercise heat stress resulted in an increase in heart rate (pre: ∆14±11BPM, post: ∆26±12BPM) and AIX@75 (pre: ∆7±7%, post: ∆14±12%) and a decrease in post-exercise TVR (Δ0.1±0.2s/mmHg/ml) (Main effect: Condition; P≤0.03). Only post-exercise heat stress reduced SYS (Δ12±14mmHg), cSYS (Δ9±12mmHg), and PWV(Δ0.4±0.4m/s) (Condition x Time; P≤0.03). CONCLUSION: Low intensity exercise heat stress has greater acute cardiovascular benefits for reducing arterial stiffness and peripheral and central systolic pressures compared to exercise in neutral conditions.