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### Real-Time Hemodynamic Evidence Supporting the Safety of Acute Isometric Exercise

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Leading authorities recommend regular exercise as an effective first line strategy in the fight against rising blood pressure (BP). Specifically, isometric exercise has gained substantial ground as an effective nonpharmacological approach for lowering BP in individuals with and without hypertension. Yet, apprehension for adopting isometric exercise in clinical practice remains, even among experts, due in part to concerns over the safety of participants during sustained contractions. **PURPOSE:** To compare real-time hemodynamic responses during isometric and aerobic exercise in a normotensive population. **METHODS:** Seventeen normotensive males (18-35y) completed all test procedures. After a 15-minute seated rest, two BP measures were collected at 5-min intervals on three separate days to establish baseline. Using a randomized crossover design, participants were first assigned to either a three-session AER condition (moderate intensity, 8-min of cycling at 6 METS) or a three-session isometric handgrip condition (IHG; moderate intensity, 8-min (2-min alternating right and left at 30% MVC with 1-min rest periods)) with 48 hours separating each session. A one-week washout period separated conditions. For AER and IHG, BP measures were collected at 1, 4, 7, and 10 min of exercise and 2, 5, 10, 20 and 30 min of recovery. Systolic BP, diastolic BP, and heart rate were collected, and mean arterial pressure (MAP) and rate pressure product (RPP) were calculated and analyzed. A two-way, repeated measures ANOVA (time x condition) was used. **RESULTS:** There were no recorded peak BP values in excess of accepted exercise test termination criteria ( $\geq 250$  mmHg systolic and  $\geq 115$  mmHg diastolic). Significant interactions were uncovered wherein systolic BP and RPP were higher during the AER compared to IHG exercise sessions ( $P < 0.01$ ). Conversely, diastolic BP and MAP were both higher in the IHG compared to the AER condition ( $P < 0.01$ ). **CONCLUSION:** No hypertensive response to exercise was observed during either condition. IHG elicited a lower myocardial burden when directly compared to AER. Our findings suggest that an acute bout of IHG can be used safely and effectively in normotensive males. Future research should aim to quantify similar hemodynamic responses in participants with diagnosed hypertension.