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Effect of Acute Arm versus Leg Exercise on Central Blood Pressure

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Regular exercise is an important non-medical intervention to reduce risk of cardiovascular disease (CVD). Aerobic exercises like running, and cycling may lower CVD risk through favorable effects on central blood pressure and vascular function (i.e., reduced pressure from wave reflections). Arm ergometry exercise is a popular exercise mode used for rehabilitation, but little is known about the effect of arm ergometry exercise on CVD risks factors like central blood pressure and vascular function. **PURPOSE:** Compare the acute effect of leg versus arm exercise on central blood pressure and vascular function. **METHODS:** Twenty-one participants (n = 11 female, Age 21±3, BMI 24.5±3.2 kg/m²) completed two visits to the Human Performance Laboratory. With participants in the supine position at rest, central systolic blood pressure (cSBP), central diastolic blood pressure (cDBP) and augmentation index (AIx, a measure of vascular function related to pressure from wave reflections) was measured using an oscillometric central blood pressure cuff before and immediately after acute exercise. Participants performed either arm or leg cycling exercise at moderate intensity (heart rate between 65%-75% of age-predicted maximal heart rate) for 20 minutes on two separate days in a randomized crossover design. Data were analyzed using a 2-condition (arm vs leg) x 6-time point (2 pre vs 4 post exercise) repeated measures analysis of variance. **RESULTS:** There was a condition-by-time interaction for AIx (p = 0.011). AIx slightly increased from 41±16% at rest to a peak of 43±13% following arm exercise but decreased from 40±14% at rest to a nadir of 23±14% following leg exercise. There was a condition-by-time interaction for cDBP (p = 0.011). cDBP decreased from 64±8 mmHg at rest to a nadir of 55±7 mmHg following arm exercise but increased immediately following leg exercise from 63±9 mmHg at rest to a peak of 70±8 mmHg. There was no condition-by-time interaction for cSBP (p = 0.721). cSBP similarly increased from 101±10 mmHg at rest to a peak of 104±11 mmHg following arm exercise and increased from 101±9 mmHg at rest to a peak of 108±13 mmHg following leg exercise (p < 0.001). **CONCLUSION:** Compared to leg exercise, arm exercise increased AIx and decreased cDBP. Since an increase AIx may increase left ventricular workload and a reduction in cDBP may reduce coronary perfusion, arm ergometry exercise may create an acute mismatch in myocardial supply and demand. **SIGNIFICANCE/NOVELTY:** Leg exercise may be considered as a more effective exercise mode for reducing CVD risk compared to arm exercise.