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## Acute Handgrip Exercise Alters the Inter-arm Systolic Blood Pressure Difference in Young Males and Females

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A large inter-arm difference (IAD) in systolic blood pressure (BP) is linked to an increased likelihood of cardiovascular and peripheral vascular disease, hypertension, and premature mortality. Previous research has determined that an acute bout of aerobic exercise can alter IAD both during the activity and in post-exercise recovery. Isometric handgrip exercise (IHE) is known to alter BP both acutely and chronically, with potential sex differences and mechanisms noted. No prior investigations have examined the effect of IHE on IAD in males or females. **PURPOSE:** To characterize IAD and associated cardiovascular responses (heart rate variability (HRV), systolic/diastolic BP) to IHE. **METHODS:** On visit one, participants completed three maximal voluntary isometric contractions (MVIC) per arm using a Jamar handgrip dynamometer. During visit two, after a five-minute rest, a series of three resting bilateral BP measures were collected and averaged (REST) utilizing a Microlife Watch BP device. Following resting measures, participants maintained the handgrip dynamometer at 20% of their MVIC for two minutes (arm randomly assigned), at which time bilateral BP was again measured (IHE). Upon completion of IHE, subjects released the dynamometer and two additional bilateral blood pressure measures (REC 1 and REC 2) were taken at one-minute intervals. An independent-samples t-test and repeated measures ANOVA were used to compare and track variables of interest. **RESULTS:** Resting IAD was positively correlated with BMI (.354;  $P < 0.05$ ) and waist circumference (.383;  $P < 0.05$ ). IHE resulted in an increase in IAD in both males and females. Males demonstrated higher IAD at rest ( $7 \pm 6$  vs.  $3 \pm 3$  mmHg) and during handgrip ( $12 \pm 9$  vs.  $5 \pm 4$  mmHg) than their female counterparts ( $P < 0.05$ ), with males also expressing a lower high-frequency HRV at rest ( $P < 0.05$ ). **CONCLUSION:** Isometric handgrip exercise altered the inter-arm difference from rest to exercise, with males displaying an increased difference during both conditions. The attenuated exercise pressor response observed in female participants may be due, in part, to a higher observed baseline of cardiovagal modulation.