Sex Differences in Augmentation Index in Response to Acute Dynamic Exercise

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Augmentation index (Alx) is derived from pressures imposed on the left ventricle as a result of systolic peripheral wave reflection. Differences in Alx in response to an acute stress, such as exercise, may prove useful for predicting future cardiovascular risk in younger adults, but less is known about whether this response differs between men and women. **PURPOSE:** To examine whether there are sex differences in Alx in response to an acute bout of exercise in healthy individuals. **METHODS:** Apparently healthy recreationally active individuals (18-42 yrs old; 10 men and 11 women) arrived at the lab 12 hrs fasted. Baseline measurements for Alx were taken using cuff-based applanation tonometry on the dominant arm. Participants underwent four rounds of dynamic body weight exercises. Alx measures were repeated at 5-, 10-, and 15-minutes post exercise and again 24-hrs post exercise. All Alx values were normalized to a heart rate of 75 bpm (Alx75). **RESULTS:** Alx75 was significantly higher in women (5.9 ± 3.6%) compared to men (-3.9 ± 2.6%) at baseline (P=0.04). Compared to baseline there was a significant increase in Alx75 in men (13.6 ± 3%; P<0.001) and women (26.2 ± 3.9%; P<0.001) 5-min post exercise with women exhibiting a significantly greater response (P=0.02). Compared to values at 5-min post exercise, there was a significant drop in Alx75 at both 10-min (18.6 ± 3.6%; P<0.001) and 15-min (15 ± 3.6%; P<0.001) post-exercise in women. However, Alx75 remained elevated in men at both 10-min (16 ± 3.4%; P=0.33) and 15-min post exercise (12 ± 3.2%; P=0.1). Differences between sexes were not evident at either 10- or 15-min post exercise (P=0.58 and P=0.51, respectively). Alx75 returned to baseline levels at the 24-hr visit (P=0.57 for both men and women) and resting sex differences were again apparent (-5.5 ± 3.5% in men vs. 7.2 ± 3.5% in women; P=0.01). **CONCLUSIONS:** This study demonstrates sex differences in resting and post-exercise induced increases in Alx75. These findings suggest potential physiological or structural differences in women that are influencing arterial and left ventricular pressures at rest and in response to exercise.