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Relationship Between Left Ventricular Mass and Exercising Systolic Blood Pressure in Women

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The elevated systolic blood pressure (SBP) that occurs during exercise contributes to the increase in left ventricular mass relative (LVM) to body surface area (LVM/BSA) resulting from exercise training. Resistance training primarily hypertrophies LVM in parallel resulting in thicker chamber walls. Conversely, aerobic exercise hypertrophies LVM in parallel and series thickening the walls and increasing chamber size. **PURPOSE:** Determine if a correlative relationship exists between the SBP response to resistance exercise (eSBP) and LVM/BSA in women with varied exercise training histories. **METHODS:** Twenty-nine young, adult women participated (age 23 ± 4 yrs, height 165 ± 7 cm, body mass 65.4 ± 11.4 kg, body surface area 1.72 ± 0.16 m², resting stroke volume 43 ± 11 mL/beat, SBP 110 ± 10 mmHg, diastolic blood pressure 68 ± 7 mmHg). The participants were mostly active, but exercise habits varied (weekly aerobic exercise $n=23$, weekly resistance exercise $n=21$, both $n=19$, no exercise $n=4$). LVM was estimated by using linear cardiac measurements from the parasternal long axis echocardiographic view. Exercise consisted of 5 sets of bilateral leg extension at 70% of 1 repetition maximum with 60s rest intervals while continuously monitoring blood pressure using finger plethysmography. Pearson correlations were used to examine relationships of interest to the eSBP change from rest to the final 10s during set 5. **RESULTS:** LVM/BSA (71.8 ± 14.9 g/m²) was shown to be inversely related to eSBP (33 ± 15 mmHg) ($r=-0.512$, $p=0.004$). Interventricular septum width during diastole (0.90 ± 0.14 cm) ($r=-0.330$, $p=0.080$) and left ventricle internal diameter during diastole (4.32 ± 0.41 cm) ($r=-0.341$, $p=0.069$) displayed insignificant inverse trends vs eSBP. Posterior wall thickness during diastole (0.88 ± 0.16 cm) ($r=-0.196$, $p=0.308$) did not correlate to eSBP. **CONCLUSION:** This preliminary analysis suggests that a lower systolic blood pressure response to resistance exercise may be related to greater left ventricular muscle mass in women with varied exercise training histories. These findings may have been influenced by the habitual aerobic training of the participants.