

The Effect of Isometric Arm or Leg Exercise on Resting Blood Pressure and Arterial Distensibility in Persons Medicated For Hypertension

Adrienne Visocchi¹, Cheri McGowan², Martha Faulkner², Robin Verduyn², Neil McCartney², Maureen MacDonald²

Hypertension and arterial distensibility are independent risk factors for CVD. Previous research has found that isometric training reduces resting blood pressure (RBP) (Wiley et al. 1992; Taylor et al. 2003) yet the mechanisms responsible remain elusive. Improved arterial distensibility (AD) may contribute to this reduction in RBP. This study compared the impact of isometric arm and leg exercise on RBP and central and peripheral AD in persons medicated for hypertension.

RBP, as assessed by brachial oscillometry, and AD, as assessed by Doppler ultrasound and applanation tonometry in the carotid, brachial and femoral arteries, were measured pre and post training. Participants performed isometric handgrip (IHG) exercise (n=10), or isometric leg press (ILP) exercise (n=6) 3 times/wk for 8wks at 30% MVC.

Results indicated that following IHG exercise systolic blood pressure decreased significantly (140.2 mmHg 3.82 to 132.3 mmHg 3.97), while no decrease was observed after ILP exercise. Diastolic blood pressure did not change after IHG or ILP exercise. Carotid AD improved significantly following IHG exercise ($0.1105 \text{ mmHg}^{-1} \times 10^{-2}$ 0.0093 to $0.1669 \text{ mmHg}^{-1} \times 10^{-2}$ 0.0221), while no changes occurred in the ILP exercise group. Peripheral AD did not change following IHG or ILP exercise. The results of the study indicate that IHG exercise improves resting systolic blood pressure and carotid AD.

¹Kinesiology, McMaster University, 1280 Main Street West, Hamilton, Ontario, L8S 4K1, Canada,

²McMaster University