

Isometric handgrip (IHG) training-induced reductions in resting blood pressure: Reactivity to a 2-minute handgrip task identifies responders and non-responders in young normotensive individuals

Yasina Somani¹, Sarah-Anne Hanik¹, Amanda Malandruccalo¹, Shane R. Freeman¹, Nic Caruana¹, Mark Badrov¹, Anthony Baross², Ian Swaine³, Kevin J. Milne¹, Cheri L. McGowan¹

¹Physical Activity and Cardiovascular Research Laboratory, University of Windsor, Windsor, Ontario, CA

²Sport and Exercise Science, University of Northampton, Northampton, UK

³Sport and Exercise Science, Canterbury Christ Church University, Canterbury, UK

In people with hypertension, systolic blood pressure (SBP) reactivity to an isometric handgrip task (IHGT), but not a cold pressure task (CPT), is predictive of IHG training-induced reductions in resting SBP. To investigate whether these findings could be extended to include young normotensives, resting BP and BP reactivity to an IHGT (2-minute sustained contraction at 30% maximal voluntary contraction, MVC) and a CPT (2-minute hand immersion in a cold water bath) were measured prior to and following 10 weeks of IHG training (4, 2-minute IHG contractions at 30% MVC, using alternating hands, interspersed with 1-minute rest periods, 3X/week) in 7 normotensive individuals (3 females, 4 males; age=25 ± 5.7 years). BP reactivity was derived by calculating the difference between peak stress BP and mean baseline resting BP. Significant training-induced reductions in resting SBP ($p < 0.001$) were strongly correlated with pre-training SBP reactivity to the IHGT ($r = -0.8$, $p = 0.03$), but not the CPT ($r = 0.2$, $p = 0.6$). These preliminary findings suggest that SBP reactivity to a short and simple handgrip task can be used as a predictive tool to identify who will respond best to IHG training. It might be possible to further explore how the IHG training stimulus could be optimized in non-responders, to ensure that they too, experience reductions in resting BP.