P58 Structured Exercise Training is Associated with Better Post Occlusive Reactive Hyperaemia in Skeletal Muscle Measured using Near Infrared Spectroscopy (NIRS)

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ABSTRACT

Background: Participation in structured exercise training may improve microvascular function. Post occlusive reactive hyperaemia (PORH) is a measure of microvascular function in skeletal muscle and can be assessed using near-infrared spectroscopy (NIRS). We examined PORH following a short and a long arterial occlusion to test whether individuals who participate in more structured exercise have better PORH.

Methods: 18 healthy volunteers (mean age = 23.1 (standard deviation (SD) = 4.9 y), male = 12) underwent 30 s and 5 minute arterial occlusions of the left lower leg using a cuff inflated to supra-systolic pressure. Change in oxygenated haemoglobin concentration (oxy-Hb) was measured from the gastrocnemius using NIRS (Artinis, Netherlands). PORH was measured as time to 50% (T_{50}) of peak oxy-Hb following cuff release and a lower T_{50} indicates a better response. Exercise participation was categorised into high ($n = 12$) or low ($n = 6$) based on self-reported hours of structured exercise per week (high ≥4 hr per week). Results are given as median (IQR) and statistical comparison was by the Mann Whitney *U*-Test.

Results: High exercise participants had a greater PORH response than low exercise participants (T_{50}: 8.0 (6.2, 9.5)s vs 12.5 (8.6, 27.2)s, $p = 0.04$; Figure 1a). The hyperaemic response to 30 s occlusion was also better in the high exercise group (T_{50}: 2.4 (1.7, 6.6)s vs 4.3 (3.6, 4.9)s $p = 0.17$; Figure 1b), although this difference was not statistically significant.

Conclusion: Individuals who participate in more structured exercise have evidence of improved microvascular function in skeletal muscle.
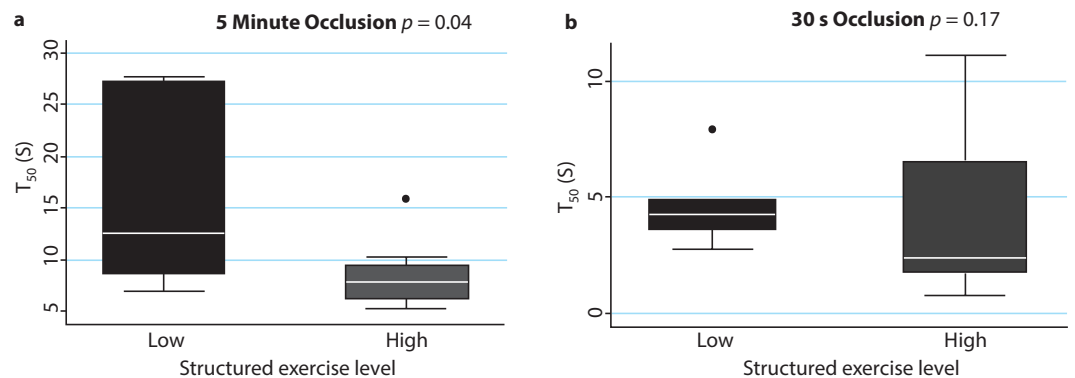
Figure 1 | a & b Boxplots comparing the PORH response in low and high exercise groups. Data are 12.5 (8.6, 27.2)s and 8.0 (6.2, 9.5)s for the low exercise group and the high exercise group respectively in the 5 minute occlusion compared with 4.3 (3.6, 4.9)s and 2.4 (1.7, 6.6)s in the 30 s occlusion. *p*-values are calculated using a Mann Whitney *U*-Test.

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