The effect of IPC on central and peripheral fatiguing mechanisms following sustained maximal isometric exercise

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Ischemic preconditioning (IPC) has been speculated to elicit performance benefits by inhibiting neural feedback from metabolically sensitive muscle afferents during exercise. We hypothesized that IPC could affect the mechanism of centrally mediated fatigue following a maximally fatiguing protocol. Eleven resistance trained males completed three 2 min maximal voluntary contractions (MVC's) *via* an isometric leg extension in a repeated measures crossover design separated by a minimum of 48 h. These tests were preceded by treatments of IPC (3 × 5 min intervals at 220 mmHg bilateral leg occlusion), SHAM (3 × 5 min intervals at 20 mmHg bilateral leg occlusion) or CON (30 min passive rest). Femoral nerve stimulation was utilised to explore central and peripheral mechanisms associated with reductions in maximal force and rate of torque development. This was profiled at baseline (BL), following treatment/prior to the 2 min MVC (PRE), immediately post (IMMED) and then again at both 10 s (POST10) and 1 min post (POST1); time profiles were selected due to the rapidly recovering nature of central motor drive. Peak (HHbpeak) and the slope (HHbslope) of tissue deoxygenation were measured throughout the 2 min MVC's *via* near-infrared spectroscopy. Voluntary activation did not significantly decline (P>0.415) following the 2 min MVC's and was not different between conditions (P>0.513). Evoked twitch torque was decreased (-59.1±6.48Nm; $P<0.005$) (mean±SEM) from PRE (87.3±3.86Nm) to IMMED (28.3±6.29Nm) although there were no effects for condition (P>0.941). There were no differences between conditions in the total work (15100±450J) or time profiled work (P>0.275) completed during the 2 min MVC's. HHbpeak was significantly elevated from baseline (13.0±6.9μM; $P<0.005$) however was not different between conditions (P>0.233) alongside HHbslope (P>0.378). These findings demonstrate that IPC does not affect central or peripherally mediated mechanisms of fatigue during a sustained 2 min maximal effort isometric leg extension task.