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Repeated Bout Effect and Cross-Transfer: Evidence of Dominance Influence

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More Information

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LETTER TO EDITOR REFERENCES

Dear Editor-in-chief

Resistance exercise often leads to exercise-induced muscle damage (EIMD). Muscle oedema, muscle soreness, increase in serum creatine kinase (CK) activity, restricted range of motion and strength loss are markers of EIMD. It is well documented that symptoms of EIMD are reduced following a repeated bout of similar exercise, this occurrence has been referred to as the repeated bout effect (RBE) (McHugh, 2003).

Cross-transfer or cross-education is a phenomenon related to increases in the strength of the contralateral (untrained) limb following training in the ipsilateral (trained) limb (Connolly et al., 2002; Howatson and Van Someren, 2007) and is explained primarily by neural adaptations (Hortobágyi et al., 1997). As applicable to the strength gains, the cross-transfer effect have been proposed as plausible for the protection against muscle damage after a first bout of damaging exercise to a contralateral muscle. Connolly et al., 2002 were the ?rst to examine whether the protective effects of a prior bout of eccentric exercise could transfer to the contralateral limb. They submitted subjects to two bouts of lower limb damaging exercise and reported no evidence of a cross-transfer effect. However, Howatson and Van Someren, 2007 and Starbuck and Eston (2012) provided evidence that the protective effect of a prior episode of EIMD was cross transferred in the elbow ?exors and also related this effect to a neural adaptations.

Interestingly, there is evidence of different motor control strategies employed by dominant and non-dominant arms during motor tasks (Pereira et al., 2012), which could influence the neural adaptations associated with the cross-transfer effect. Presently, however, there have been no studies conducted to investigate the influence of limb dominance on the cross-transfer effect related to RBE.

We submitted 21 volunteers (19.0 ± 1.7 yr; 66.4 ± 8.5 kg; 1.76 ± 0.07 m), healthy and non-active men, to two bouts of upper limb damaging exercise. The volunteers were randomly divided into 3 groups: N-N (n = 7) that carried out 2 exercise bouts with non-dominant arm (control); N-D (n = 7) that carried out the first bout with non-