The Influence Of Sex On The Cross-over Effects of Handgrip Fatigue

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ABSTRACT

Recent data shows that fatigue may 'cross-over' to the contralateral, non-fatigued muscle group following fatiguing unilateral activity and these effects may be influenced by sex. **PURPOSE**: This study examines whether the cross-over effects of handgrip fatigue are influenced by sex. **METHODS**: Thirty-two (n = 16 females, n = 16 males) right-hand dominant individuals performed a maximal intermittent handgrip fatigue protocol with their non-dominant hand. A control visit was also performed, and the visits were completed in a randomized order. The fatigue protocol consisted of nine, 20 s maximal handgrip contractions with 20 s of recovery between bouts. Maximal unimanual handgrip strength was measured before and after the fatigue protocol for the non-fatigued hand. The relative change in maximal force for the contralateral, non-fatigued hand was compared across visits and between sexes with a mixed factorial ANOVA test. **RESULTS**: The results show no evidence of a cross-over effect of fatigue ($p = 0.208$) and no sex differences in the contralateral responses ($p = 0.354$). Interestingly, the results show a small effect for increases in maximal strength for the contralateral hand following fatigue compared to control conditions (+3.1 ± 11.9% versus -0.04 ± 6.4%, $d = 0.230$). There was also a small effect for greater increases in contralateral maximal strength following fatigue for males compared to females (+4.9 ± 12.7% versus +1.2 ± 10.9%, $d = 0.318$). **CONCLUSION**: These results show no evidence of the cross-over effects of fatigue for the handgrip muscles. The data do not support the notion that sex moderates the cross-over effects. These findings have implications for future research investigating cross-limb interactions.