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Can Blood Flow Restriction Enhance the Effectiveness of Electrical Stimulations for Treating Muscle Damage?

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The use of electrical stimulations (E-STIM) and blood flow restriction (BFR) have each been independently shown to alleviate sensations of discomfort and enhance the recovery of force following periods of muscle damage. To our knowledge, no studies have tested whether the simultaneous application of E-STIM and BFR can produce even greater effects. **PURPOSE:** To test if applying BFR during E-STIM would produce greater effects at treating symptoms of muscle damage as compared to E-STIM in the absence of BFR. **METHODS:** Individuals completed one set of eccentric elbow flexion exercises to induce muscle damage. Forty-eight hours later, E-STIM was applied using an interferential current administered to both arms for 20-minutes; however, only one arm completed the E-STIM protocol while also undergoing repeated bouts of BFR (full occlusion for 2-minutes separated by 1-minute rest intervals). Discomfort (Borg CR10+) and isometric strength of the elbow flexors were assessed immediately before the damaging exercise, immediately before the treatments, and 0, 10, and 30-minutes post-treatment. Bayesian repeated measures ANOVAs with uninformed priors were used to compute Bayes Factors (BF_{10}) for ($BF_{10} < 0.33$) or against ($BF_{10} > 3$) the null hypothesis. **RESULTS:** A total of 22 individuals (11 females) completed the study. There were no interactions with respect to discomfort ($BF_{10} = 0.008$) or isometric strength ($BF_{10} = 0.009$) indicating that the addition of BFR did not alter the effectiveness of E-STIM. There was a main effect of time indicating that the damaging exercise was successful at depressing torque (pre: 284 N, post: 199 N; $BF_{10} = 2.70e9$) and inducing discomfort (pre: 0 au, post: 6.4 au; $BF_{10} = 3.21e17$). While isometric strength did not recover with the E-STIM treatments, discomfort was reduced at each the immediate post (5.3 au; $BF_{10} = 56,294$) 10-min post (5.0 au; $BF_{10} = 46,163$), and 30-min post (4.9 au; $BF_{10} = 707,600$) time points. **CONCLUSION:** E-STIM may be useful for treating discomfort, but does not appear capable of recovering strength associated with muscle damage. The efficacy of E-STIM was not enhanced if performed under BFR.