TACSM Abstract

Differences in Neuromuscular Adaptations After Two Weeks of Conventional vs Blood Flow Restriction Resistance Training

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ABSTRACT

PURPOSE: The purpose of the study was to determine the neuromuscular changes in the rectus femoris (RF) muscle as measured by electromyography (EMG) following short-term resistance training with and without blood flow restriction (BFR). **METHODS:** 12 males (age = 27.4 ± 6.3 years; height = 171 ± 7 cm; weight = 79.8 ± 13.2 kg) performed six sessions of lower body unilateral resistance training using a leg extension machine. The leg on which BFR was applied was determined through randomization leg dominance Each training session consisted of unilateral knee extensions with and without blood flow restriction. Electromyography data was recorded for each participant during two isometric maximum voluntary contractions (MVC) and two isokinetic knee extension tests (180°/s and 60°/s) using a Biodex System 4 Pro™. EMG was recorded from the RF during these tests. Resistance training consisted of six non-consecutive sessions of knee extension exercises performed in a time frame of two weeks. For the BFR group, subjects trained for a total of four sets (30, 15, 15, 15) at an intensity of 20% 1RM. The contralateral limb was trained with two sets of 11 repetitions at an intensity of 70% 1RM without BFR. The volume of exercises was similar for both conditions. **RESULTS:** No condition*time interactions or condition and time main effects were observed for root mean square (RMS), mean RMS, yMax, and median frequency (MDF) in both MVC and isokinetic 180°/s and 60°/s ($p>0.05$). **CONCLUSIONS:** Both training conditions resulted in insignificant changes and there was no significant difference found between time points. It could be concluded that this was not enough time or stimulus to note major differences across modalities in relation to neuromuscular adaptations of the RF as measured by EMG. Further studies should investigate the effects of higher volume load on neuromuscular adaptations.