TACSM Abstract

Differences in Quadriceps Activation During Return-to-play in Lower Body Resistance-Trained Females

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ABSTRACT

Muscular activation in the quadriceps is indicative of proper muscular function, which is the sole determinant of a return-to-play assessment. Specifically, the activation within the knee extensors is essential to the evaluation of ACL tears. **PURPOSE**: The purpose of the study was to bilaterally compare muscular activation of the vastus lateralis (VL), vastus medialis (VM), and rectus femoris (RF) during isokinetic knee extensions across velocities. **METHODS**: 8 lower-body resistance-trained females (n=8; age= 19 ±1, height= 169.06 ±3.85 cm, weight= 64.46 ±4.76 kg) completed this study. Using an isokinetic dynamometer, subjects performed continuous isokinetic knee extensions at velocities of 60°/sec, 180°/sec, and 240°/sec. Three separate 4-pin surface electromyography (EMG) sensors were used to record activation within the VL, VM, and RF during the protocol. Average root mean squared (RMS) values were calculated via manual editing techniques across the contractions at all three velocities. A three-way mixed factorial analysis of variance (ANOVA) (velocity [60°/sec v 180°/sec v 240°/sec] x muscle [VL v VM v RF] x leg [dominant v non-dominant]) was used to compare average RMS values during the differing velocities. **RESULTS**: There were no significant velocity x muscle x leg interactions ($p>0.05$) in the RMS values. However, when collapsed by muscle and leg, there was a significant main effect ($p<0.05$) for muscle activation at each separate velocity. **CONCLUSION**: These could be due to evaluation and EPOC windows during manual editing techniques, which account for potential electromechanical delays and onset of torque production.