

ISOKINETIC MUSCLE PERFORMANCE AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A CASE-CONTROL STUDY

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ABSTRACT

Background and Purpose: Knee muscle strength deficits have been reported in individuals who have undergone anterior cruciate ligament reconstruction (ACLR). Isokinetic testing is a valid way to assess muscle strength. Some isokinetic variables, including the range of motion in the phases to attain a specific velocity, load range (sustained specific velocity), time to achieve deceleration, and qualitative analysis of the torque-angle velocity relationship, may contribute to understanding recovery of these individuals after surgery. Thus, the purpose of this study was to compare the load range (LR), time to attain velocity (TTAV), deceleration time (DT) phases, total range of motion (ROM), peak torque/body mass (PT/BM), angle of peak torque (AngPT) during LR and torque-angle-velocity relationships (TAV_{3D}) between post ACLR and matched control subjects.

Study design: Case-control.

Methods: Seven men who underwent ACLR and seven matched controls were evaluated from four to six months after surgery. Testing was performed on a Biodex System 4 isokinetic dynamometer in concentric mode at 60, 120 and 300 °/s, for knee flexion and extension.

Results: Statistically significant differences were seen for extension ROM at 60 °/s where ROM was greater in the control group. PT/BM for extensors was also significantly greater in controls by 20 % compared to ACLR at 60 and 120 °/s. PT/BM for flexors was significantly greater for controls at 60 °/s (~15 %). TAV_{3D} showed differences in torque and, specifically, the control group sustained knee flexion torque for a greater range of motion when compared to the ACLR group.

Conclusion: The ACL group presented with lower ROM and PT/BM, therefore exhibiting worse muscle performance in comparison to the control group.

Level of Evidence: 3

Keywords: Anterior cruciate ligament reconstruction, isokinetic dynamometer, torque.

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