Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

Annual Scientific Meeting, November 1st – 2nd, 2019
Conference Proceedings
International Journal of Exercise Science, Volume 9, Issue 8

Neuromuscular Function in Individuals One Year after Medical Clearance Following Anterior Cruciate Ligament Reconstruction

Alexa N. Cardella, Stephen R. Chimeenti, Paul T. Cutrufello
The University of Scranton, Scranton, PA

When an anterior cruciate ligament (ACL) tears, it becomes dysfunctional and cannot heal on its own, requiring ACL reconstruction (ACLR) and subsequent physical therapy if the person wishes to remain active. While several studies have examined strength and neuromuscular control after ACLR, noting differences between the limbs persisting after the surgery, strength and neuromuscular function have yet to be thoroughly examined one-year following rehabilitation and a physician's clearance to resume all activities. **PURPOSE:** To examine strength and neuromuscular control of both the ACL reconstructed limb (ACLRL) and uninvolved limb (UL) at more than one year post-clearance in order to examine long-term function. **METHODS:** Both men and women (n=11; 20.4±1.7 years), who had undergone ACLR and have been cleared, for at least a year, by their physician to resume full activity, served as participants in this study, as well as height and weight-matched controls (n=11; 19.6±1.3 years). The Star Excursion Balance Test (SEBT), thigh circumference, quadriceps muscle thickness via an ultrasound (US), ACL laxity via the KT-2000 test, and maximal strength during both knee flexion and extension via a handheld dynamometer were all used in determining neuromuscular function for both the ACLRL and UL. **RESULTS:** Participants had significantly smaller thigh circumference in their ACLRL (52.7±2.5 cm) compared to their UL (54.0±2.9 cm; p=0.048), significantly less muscle thickness in their ACLRL (3.4±0.6 cm) compared to their UL (3.7±0.5 cm; p= 0.005), and significantly weaker strength during flexion in their ACLRL (216.0±64.2 N) compared to their UL (235.8±54.5 N; p=0.017). However, there were no significant differences between the ACLRL and UL in the SEBT (ACLRL= 246.3±37.1 vs. UL= 252.3±33.2; p=0.105), the KT-2000 test (ACLRL= 3.7±2.5 mm vs. UL= 2.7±2.3 mm; p=0.070), or the extension strength test (ACLRL= 342.4±155.0 N vs. UL= 362.9±137.4 N; p=0.531). There were no significant differences between the legs of controls for any of the tests (p>0.05) **CONCLUSION:** The ACLRL was shown to be smaller and weaker compared to the UL when tested more than one-year after rehabilitation and a physician's clearance to resume activity without restrictions.