345 Board #198 May 29, 9:30 AM - 11:00 AM

Gender Differences In Single-leg Squat Kinematics Of Healthy Young Adults

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(No relationships reported)

There is some evidence to suggest that certain lower limb movement patterns during functional activities increase the risk of lower limb injuries, such as non-contact anterior cruciate ligament (ACL) tears. Further, the prevalence of such risky movement patterns appears to be greater amongst women than it is for men; an observation that is commensurate with ACL injury rates. Despite widespread use of the single-leg squat (SLS) test in musculoskeletal screening, a comprehensive gender comparison of trunk, pelvis, and lower limb 3D kinematics is yet to be described.

PURPOSE: To determine gender differences in SLS kinematics in healthy young adults.

METHODS: We recruited 60 healthy men and women between the ages of 20 and 40 years. Participants had 32 retroreflective markers attached to their trunk, pelvis, and lower limbs before performing three SLSs on an AMTI force plate while 3D kinematic data was simultaneously collected with a ten-camera VICON motion analysis system (Oxford Metrics, UK). Squat depth was standardised by asking participants to achieve 75 degrees of knee flexion using real time kinematic feedback. One-way ANOVA was used to make gender comparisons of kinematic parameters.

RESULTS: 30 men (25.6 ±4.8 years) and 30 women (25.1 ±3.8 years) volunteered to participate. Men were taller (1.78 ±0.08 m vs. 1.68 ±0.06 m) and heavier (77.3 ±12.0 kg vs. 59.7 ±8.2 kg) than women. Angles for peak hip external rotation (-13.4 ±5.4 deg vs. -10.0 ±4.4 deg, p=0.02), peak hip internal rotation (-2.7 ±5.3 deg vs. 3.9 ±6.1 deg, p=0.01), hip adduction range (12.1 ±5.0 deg vs. 17.5 ±6.9 deg, p=0.01), and hip rotation range (9.9 ±3.1 deg vs. 13.6 ±3.5 deg, p=0.01) were smaller for men than for women. Likewise, distance of mediolateral knee motion (173 ±46 mm vs. 205 ±59 mm, p=0.05) was shorter for men than for women. Kinematics at the trunk and pelvis did not differ between the sexes ($p > 0.05$).

CONCLUSION: Gender differences in SLS kinematics of healthy young adults appear to apply only at the hip and knee and not at the trunk or pelvis.