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ORIGINAL RESEARCH

COMPARISON OF THE '*BACK IN ACTION*' TEST BATTERY TO STANDARD HOP TESTS AND ISOKINETIC KNEE DYNAMOMETRY IN PATIENTS FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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ABSTRACT

Background: Limb symmetry after anterior cruciate ligament reconstruction may be evaluated using maximal strength and hop tests, which are typically reported using Limb Symmetry Indices (LSIs) which may overestimate function.

Purpose: The purpose of this study was to compare the Back in Action (BIA) test battery to standard hop and muscle strength tests used to determine readiness to return to sport (RTS).

Study Design: Prospective cohort.

Methods: Over two test sessions, 40 ACLR patients were assessed at a mean 11.3 months post-surgery. Initially, participants completed the 6 m timed hop and the single, triple and triple crossover hops for distance, and isokinetic knee extensor and flexor strength assessment. The second session involved completion of the BIA battery, including stability tests, single and double leg countermovement jumps (CMJ), and plyometric, speedy jump, and quick feet tests. Pass rates for test batteries were statistically compared, including the BIA, a four-hop battery (≥90% LSI in every one of the four hop tests) and a combined 4-hop and strength battery (≥90% LSI in every one of the four hop tests, as well as ≥90% for both peak knee extensor and flexor strength). LSI differences between the four standard hop tests and the BIA single limb functional tests (the single limb CMJ and the speedy jump test) were evaluated.

Results: Significantly less participants passed the BIA battery (n = 1, 2.5%), compared with the four-hop test battery (n = 27, 67.5%) ($p < 0.001$) and the four-hop test and isokinetic strength battery (n = 17, 42.5%) ($p < 0.001$). Collectively, LSI's for the standard hop tests were significantly higher than the BIA functional single limb tests (difference = 12.9%, 95% CI: 11.1% to 14.6%, $p < 0.001$).

Conclusion: The BIA test battery appears to include some single limb functional tests that are more physically challenging than standard hop and isokinetic strength tests, highlighted by the significantly lower mean LSI's during the single limb BIA tests and the lower pass rate when employing the BIA protocol.

Level of Evidence: Level 4, case series.

Key words: Anterior cruciate ligament, return to sport, limb symmetry index, single limb hop test, isokinetic dynamometry.

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