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FUNCTIONAL TESTING AND PREDICTION OF LOWER EXTREMITY OR LOW BACK INJURY AMONG DIVISION III COLLEGIATE ATHLETES

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PURPOSE/HYPOTHESIS: Functional tests have been primarily used to assess an athlete's readiness to return to sport. The purpose of this prospective cohort study was to determine the ability of the standing long jump (SLJ) test, the single-leg hop (SLH) for distance test, and the lower extremity functional test (LEFT) as preseason screening tools to identify collegiate athletes who may be at increased risk for a time-loss sports-related low back or lower extremity injury. We expected that athletes with shorter jump and hop distances and slower LEFT scores would be at greater risk for injury.

NUMBER OF SUBJECTS: A total of 193 Division III athletes (110 female; mean +/- SD age, 19.1 +/- 1.1 years; 83 males; age, 19.5 +/- 1.3 years) were tested prior to their sports seasons.

MATERIALS/METHODS: The mean distances jumped (SLJ) and hopped (SLH) were used in study analyses after distance scores were normalized to athlete's height. The raw score for the LEFT (measured in seconds) was used in the study analyses. The athletes were prospectively followed during their sports season for occurrence of low back or lower extremity injury. Logistic regression was used to examine if an association between distance jumped or LEFT score and an increased likelihood of injury existed. Cut points for the SLJ, SLH, and the LEFT were based on prior reported clinical recommendations (CR) and the study populations' mean scores.

RESULTS: Forty-six athletes sustained a total of 63 low back or lower extremity injuries during the study. Female athletes who completed the LEFT in 118 seconds or more were 6 times more likely (OR = 6.0; 95% CI: 1.4, 24.8; $P = .01$ for the CR cut point; OR = 6.4; 95% CI: 1.3, 31.7; $P = .02$ for mean time cut point) to sustain a thigh or knee injury. Male athletes who completed the LEFT in 100 seconds or less (cut score based on CR) were more likely to experience a time-loss injury to the low back or lower extremity (OR = 3.2; 95% CI: 1.1, 9.5; $P = .03$) or a foot or ankle injury (OR = 6.7; 95% CI: 1.5, 29.7; $P = .01$) than male athletes who completed the LEFT in 101 seconds or more. Female athletes with a 10% or greater side-to-side asymmetry between SLH distances had a 4-fold increase in foot or ankle injury (OR = 4.4; 95% CI: 1.2, 15.4; $P = .02$ for the CR cut point). Male athletes with SLH distances (either leg) at least 75% of their height had at least a 3-fold increase (OR = 3.6; 95% CI: 1.2, 11.2; $P = .03$ for the R LE and OR = 3.6; 95% CI: 1.2, 11.2; $P = .03$ for L LE) in low back or lower extremity injury. The SLJ was not associated with an increased injury risk for male or female athletes.

CONCLUSION: The SLH and the LEFT appear to be useful tools for identifying Division III athletes at risk for lower-quadrant sports injury. Thus, the LEFT and SLH warrant further consideration as preparticipatory screening examination tools for sport injury in this population.

CLINICAL RELEVANCE: The findings associated with these functional tests may be useful for physical therapists and/or strength coaches when designing their athletes' preseason training programs.