GNYACSM Original Research Abstract

Y-Balance Normative Data Relative to Previous Injury and Landing Mechanics in Male Division I Student-Athletes

KATIE SELL, OFRA POTTORF, CRISTINA LEEK, JULIA CATANZANO, STACEY WONG, ADAM GONZALEZ, TAREK HARHASH, KELLY SHAVER, LILLY BERNARDI

Human Performance Laboratory; Department of Allied Health and Kinesiology; Hofstra University; Hempstead, NY

Category: Faculty

ABSTRACT

The Lower Quarter Y-Balance (LQYB) test has emerged as a popular approach for quantifying lower extremity (LE) dynamic balance and identify asymmetries that may elevate injury risk. However, research on LQYB scores across multiple sports is limited and the relationship of these scores to injury risk is scarce. **PURPOSE**: The purpose of this study was to present normative data for LQYB composite scores for the right (LQYB-R) and left (LQYB-L) LE in male student-athletes, and to identify differences in LQYB scores in athletes with a prior LE injury or errors during a jump-landing task. **METHODS**: Male student athletes (N = 147; 19.9 ± 1.5 y, 182.3 ± 7.9 cm, 183.1 ± 24.5 lbs) across multiple sports (wrestling, basketball, soccer, tennis, lacrosse, and baseball) conducted the LQYB test during a pre-season test battery following physician clearance. To determine LQYB-R each athlete stood on the right LE and bent the right knee, stretching the left LE as far as possible in the anterior, posterolateral, and posteromedial directions. LE positions were then reversed for LQYB-L. Leg length was measured to calculate LQYB-R and LQYB-L. Athletes self-reported a LE injury that stopped them playing in the last year (no = LEI_0; yes = LEI_1). The Landing Error Scoring System (LESS) was used to evaluate landing patterns during a standardized jump-landing task (no errors = $LESS_0$; errors = $LESS_1$). Differences across sports and between LEI_0 and LEI_1 groups for LQYB-R, LQYB-L, and the difference between LQYB-R and LQYB-L ($LQYB_{diff}$) were examined using independent t-tests and a MANOVA with post-hoc analysis (alpha significance level of $p < 0.05$). **RESULTS**: Significant differences were found between sports for LQYB-R ($F[5, 141] = 6.27$; $p < 0.001$; partial $\eta^2 = .18$), LQYB-L ($F[5, 141] = 2.64$; $p < 0.05$; partial $\eta^2 = .09$), and $LQYB_{diff}$ ($F[5, 141] = 3.95$; $p < 0.05$; partial $\eta^2 = .12$). The $LESS_0$ group had significantly higher LQYB-R and significantly lower $LQYB_{diff}$ scores than $LESS_1$ ($p < 0.05$). No significant differences between LEI_0 and LEI_1 were found ($p > 0.05$). **CONCLUSION**: Differences in LQYB-R and LQYB-L may reflect different sport-specific stability, balance and mobility, stressing the need for sport-specific normative values. LQYB scores were able to distinguish optimal LESS performance. Whereas LQYB-R and LQYB-L scores had limited association with prior LE injury.