RESULTS

• Logistic regression analyses identified best predictor sets for previous injury and subsequent injury during season
  - BMI, MMOI, and Starter status failed to demonstrate association with prior or subsequent CLE injury
  - 3-Factor model: SFI, Y-AR%Diff, and HTH (Table 1, Figures 5-7)
    - Cut-points derived from ROC analyses of variable associations with injury
    - Previous injury: 2 of 3 positive factors; $\chi^2=14.35, p<0.01, OR: 3.67, 90\% CI: 1.27-10.57
    - Model identified 85\% of athletes who had experienced previous injury (22/26) and ruled out 40\% (14/35)
    - Subsequent injury: 2 of 3 positive factors; $\chi^2=7.48, p<0.01, OR: 5.23, 90\% CI: 1.38-19.90
    - Model identified 90\% of athletes who sustained injury during season (17/19) and ruled out 38\% (16/42)
  - 5-Factor model: SFI, Y-AR%Diff, Y-AR%LL, INV%Diff, and UVJ%Diff (Table 2, Figure 8)
    - Cut-points derived from ROC analyses of variable associations with injury sustained during season
    - 24 positive factors: $\chi^2=11.70, p<0.01, OR: 8.22, 90\% CI: 2.77-24.43
    - 5-Factor model only identified 53\% of athletes who sustained injury (10/19), but ruled out 88\% (37/42)
  - 3-Factor retrospective and 5-Factor prospective models performed similarly for injury prediction (Tables 3 & 4)

PARTICIPANTS AND PROCEDURES

• Participants were 61 high school football players (15.6±2.1 years; 180.15 cm ± 6.63 cm; 80.31 ± 15.07 kg)
• Pre-participation screening procedures:
  - Sports Fitness Index (SFI) used to quantify persisting effects of previous injuries
  - Self-reported inventory of injuries sustained during previous 12-month period acquired
  - Body Mass Index (BMI) and estimated Mass Moment of Inertia (MMOI) calculated
  - Horizontal Trunk Hold (HTH) time to failure used as an indicator of core muscle endurance (Figure 1)
    • Underarm Vertical Jump (UVJ) assessed by instrumented mat (Prototicks, Axiom Jump, Nashville, AL; Figure 2)
    • Y-Balance anterior reach (Y-AR) distance (Functional Movement Systems, Chatham, VA; Figure 3)
    • Y-AR distance represented as percent of leg length (%LL: anterior superior iliac spine to tibial malleolus)
    • Ankle inversion strength (INV) measured by handheld dynamometer (Joshi Medical, Indore, U.T; Figure 4)
    • Percent difference (%Diff) between dominant and non-dominant calculated for UVJ, Y-AR, and INV
  - Injury documentation: combination of injury records maintained by athletic trainer and post-season self-reporting
  - Analyses performed to assess associations between screening measures and injury
  - Retrospective injury definition: CLE sprain or strain that resulted in sport time loss
  - Quantified persisting effects of time-loss injuries sustained during previous 12 months
  - Prospective injury definition: CLE sprain or strain during season that required evaluation and treatment
  - Estimated pre-participation risk status used to predict subsequent injury during season
  - Data analysis methods:
    • Receiver operating characteristic (ROC) analyses identified cut-points for binary classifications of risk status
    • Cut-points derived from both retrospective (previous injury) and prospective (season injury) data
    • Cross-Analysis analyses used to assess univariate associations between screening measures and injury
    • Accuracy of prospective injury prediction using retrospectively derived cut-points assessed
  - Logistic regression analysis used to identify the strongest set of predictor variables
  - Accuracy of retrospectively developed model compared to that of prospectively developed model

REFERENCES