Screening Measures for Prediction of Foot and Ankle Injury

BACKGROUND AND PURPOSE

Three retrospective cut-points for FWI, inversion average Nm, and SFI score demonstrated retrospective association with injury (Tables 3 and 4).

The purpose of this study was to assess the potential value of foot width index (FWI), inversion strength, and injury measures for development of an accurate multivariable model for prediction of foot and ankle sprain and strain.

PARTICIPANT CHARACTERISTICS AND PROCEDURES

Participants were 84 high school football players and 51 female college athletes available for pre-season screening.

High School (HS) Football (n=84), 15.24 ±1.21, 179.48 ±8.13 cm; 80.97 ±16.50 kg

Women’s Cross-Country (n=8), 18.88 ±0.93 years; 165.74 ±7.70 cm; 59.93 ±6.23 kg

RESULTS

• Approximately 12-15% of all injuries sustained by high school and college athletes are ankle ligament sprains.

• A very high degree of interdependence exists between proximal and distal factors that greatly influences injury risk.

• Excessive foot pronation or supination has been related to increased risk for ankle sprains.

• Posterior talibial weakness has been shown to increase susceptibility to ankle instability and chronic dysfunction.

• History of any musculoskeletal sprain or strain has been associated with increased risk for subsequent injury.

• Identification of athletes with elevated injury risk is a prerequisite for implementation of risk reduction strategies.

• The purpose of this study was to assess the potential value of foot width index (FWI), inversion strength, and injury measures for development of an accurate multivariable model for prediction of foot and ankle sprain and strain.

• Isometric inversion torque appears to identify both previous injury effect and elevated risk for subsequent injury.

• Bilateral difference (% asymmetry) and average for dominant and non-dominant calculated (Nm) (Figure 5).

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• Ankle inversion force (kg) recorded for both dominant and non-dominant extremities.

• Foot Arch Index (FWI) derived from height and mass measurements.

• Ankle inversion force (Nm) calculated from moment arm measurements.

• Receiver operating characteristic (ROC) analysis used to select cut-points for binary classification of injury risk.

• Foot and Footed Inversion Power Analysis (Figure 12).

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• Cross-tabulation analysis used to quantify univariate associations between measures and injury occurrence.

• Logistic regression analysis used to develop multivariable models (retrospective and prospective).

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• Isometric inversion force measured with hand dynamometer (average of 3 trials) for both ankles.

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• Ankle inversion force recorded for both dominant and non-dominant extremities.

• Foot Arch Index (FWI) calculated from moment arm measurements.

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• Acquisition of pre-participation measures can identify athletes likely to benefit from targeted interventions.

REFERENCES


