Prediction of Sport-Related Concussion and Musculoskeletal Injury Occurrences among High School Football Players

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**Recommended Citation**

Wilson, Andrew; Wilson, Brittney; Dishman, Megan; Wilkerson, Gary; and Acocello, Shellie, "Prediction of Sport-Related Concussion and Musculoskeletal Injury Occurrences among High School Football Players". *ReSEARCH Dialogues Conference proceedings*. https://scholar.utc.edu/research-dialogues/2020/day2_posters/103.

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The purposes of this study were to assess retrospective and prospective associations of risk screening metrics (survey responses and smartphone test of perceptual-motor efficiency) with SRC occurrence. A total of 64 CLEIs were sustained (Table 1); 43% (40/92) sustained at least 1 CLEI; 26 sustained 1 CLEI; 14 sustained ≥ 2 CLEIs. The retrospective association of HxSRC with CLEI occurrence presented in Figure 12 was 2.0 with CLEI occurrence presented in Figure 12.

Retrospective associations of OWI symptoms, OWI score, SFI score, and Flanker Test EIR with SRC occurrence presented in Table 3. ROC curves with AUC values presented for each of the 10 items of OWI (Figure 4) and for each of the 10 items of SFI (Figure 5). Prospective associations of OWI symptoms, OWI score, SFI score, and Flanker Test EIR with SRC occurrence presented in Table 4. ROC curves with AUC values presented for each of the 10 items of OWI (Figure 6) and for each of the 10 items of SFI (Figure 7). HxSRC prospective associations of OWI symptoms, OWI score, SFI score, and Flanker Test EIR with new SRC presentation Table 4. ROC curves with AUC values presented for each of the 10 items of OWI (Figure 8) and for each of the 10 items of SFI (Table 4). Among 14 HxSRC cases, prospective association of CLEI occurrence identified for Figure 10 and Flanker Test EIR Table 4. Classification cascade tree for prospective association of SFI 1.9 and EIR 2.0 with CLEI occurrence presented in Figure 12.

CLINICAL RELEVANCE

The sensitivity of current clinical tests for detection of subtle impairment of brain functional connectivity has been questioned. Several standardized Assessment of Concussion and Balance Error Scoring System may be inadequate for cognitive-endor assessment. Our findings strongly support utilization of the OWI, SFI, and Flanker Test to identify individual high school football players who are likely to derive greatest benefit from focused efforts to further assess cognitive-motor function and potentially reduce injury risk.