ABSTRACT

TITLE:	The Effects of Environment and Fatigue on the Balance Error Scoring System and the Standardized Assessment of Concussion in Intercollegiate Football and Soccer Athletes
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ABSTRACT: A variety of field concussion tests have been developed to assess the athlete's ability to return-to-play following a concussion. It has been suggested that fatigue and environment may affect the results of these clinical tests. To measure the affect of environment and fatigue on the Balance Error Scoring System (BESS) and the Standardized Assessment of Concussion (SAC) among collegiate football, women's soccer, and men's soccer athletes. This study was performed in a clinical setting using one-hundred thirty-four (134) NCAA division II collegiate football, men's soccer, and women's soccer athletes with no current concussion or lower extremity injury. Each concussion test (BESS and SAC) was performed in 3 scenarios, 1) secluded environment during physicals, 2) on-field prior to a practice (non-fatigued (NF)), and 3) on-field following a practice (fatigued (F)). BESS and SAC scores were determined for each of the 3 testing scenarios. BESS scores were calculated by adding each loss of balance incident during the 6 testing conditions (on ground: double-leg, single leg, tandem; on foam pad: double-leg, single leg, tandem); the lower the score, the better the balance. SAC scores were calculated by summing each correct answer to the cognitive questions (time, place, recall, sequencing); the higher the score, the better the cognitive function. Statistical tests included 2 one-way analysis of variance with repeated measures to analyze the change in the clinical test scores. No between sport differences were significant for either the BESS or the SAC. A significant increase was found in the BESS measurements between the Field-NF and Field-F scenarios. A significant increase was found in the SAC measurements between the Field-NF and Field-F scenarios. Our findings reveal that results of the BESS and SAC are not influenced by sport played. Fatigue has an effect on the outcomes of both the BESS and the SAC when conducted on the field.