Factors that Impact Return to Progression in High School Athletes Sustaining a Concussion
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INTRODUCTION

- 1.6-3.8 million sports-related concussions (SRC) are reported in the U.S. every year.
- SRCs are evaluated through symptoms (symptom evaluation), balance and vestibular-ocular reflex (VOR), and three common symptoms occur after a SRC: headache, dizziness, and difficulty concentrating.
- Balance assesses postural instability.
- VOR assesses the coordination between head and eye movement.
- Current standards for diagnosing a SRC and determining the return to progression (RTP) state that clinicians utilize the SCATS, which includes symptom evaluation and balance examination.
- RTP varies with athletes; it can range from 10 days to 3-4 weeks.
- RTP begins with light aerobic activity, such as the Buffalo Concussion Treadmill Test (BCTT).
- Anecdotal evidence suggests that the presence of nystagmus/saccadic movement is indicative of RTP timeline after SRC; however, it is not assessed in the SCATS.

METHODS

- **Instrumentation**
  - **SCATS**
  - Symptom Evaluation: 22-item Post-Concussion Symptom Scale, rates symptoms on a scale of 0-6
  - Balance Exam: Modified Balance Error Scoring System (mBESS), tested on non-dominant foot on hard surface with no shoes
  - Vestibular-Ocular Assessment: Smooth Pursuit and Saccades test for nystagmus and saccadic movement
  - Buffalo Concussion Treadmill Test: Incremental treadmill test

- **Statistical Analysis**
  - Multiple linear regression was used to determine the best predictors for RTP after a SRC. Performed twice, once without nystagmus/saccadic movement and once with nystagmus/saccadic movement as a predictor, alpha of <0.25. Predictor variables with significance <0.05 inputted again, alpha of <0.05 to determine statistical significance.

RESULTS

- **Hypothetical Table**

CONCLUSIONS/DISCUSSION

- Presence of difficulty concentrating predicted 8.8% of variance in the timeline of RTP after a SRC (p<0.001).
- A positive B value for presence of difficulty concentrating indicates that as difficulty concentrating increases, the time of beginning the RTP increases by 10.168 days.
- A limitation of this study was that there were a number of de-identified participants with nystagmus/saccadic movement that had to be eliminated from this study due to the lack of completing the BCTT.
- Future studies should investigate other variables that may contribute to the timeline of RTP after a SRC.

REFERENCES