

Predicting Persistent Post Concussion Symptoms Using Objective Aerobic Testing in Adolescent Athletes: A Retrospective Cohort Study.

Background

The Buffalo Treadmill Concussion Test (BCTT) assesses autonomic nervous system deregulation following concussion. The purpose of this study is to assess if the result of a BCTT is associated with time to recovery among adolescent athletes with concussion.

Methods

Data from Canadian adolescents under the age of 18 between January 2016 and January 2019 will be extracted from the Complete Concussion Management database. Athletes included have been diagnosed with a sport-related concussion, performed their first, since time of injury, BCTT between 10 and 21 days after injury and score 7 or above on their concussion Symptom Severity Score at time of intake. The BCTT will be categorized into “failed” versus “not failed”. A failed BCTT is identified by symptom exacerbation before the participant achieves a maximal level of perceived exertion. The outcome, days from injury to recovery, will be grouped as recovered and not recovered at 30 days and 90 days post injury. Recovery is defined by completion of stepwise return-to-play process, completion of Gapski-Goodman exertion test and normalization of Symptom Severity Score. Chi square test will be used for analysis at the bivariate level. Two logistic regression models will be performed to assess the relationship between the BCTT and recovery; one for the outcome recovery at 30 days and the other for the outcome recovery at 90 days. Each model will include BCTT, the main independent variable, and the covariates age, gender, loss of consciousness at injury, presence of amnesia at injury, sport injured, concussion history, intervention of cervical spine mobilization/manipulation, soft-tissue therapy, vestibular rehabilitation, visual rehabilitation, number of clinical visits, days from injury to assessment, days from injury to first BCTT, number of total BCTTs performed, and Symptom Severity Score at time of intake.

Significance

Identification measures for long-standing concussion symptoms will allow for anticipatory clinical guidance.