



16th Annual Brain Injury Conference

February 9, 2024 | Marriott Downtown at CF Toronto Eaton Centre

Poster #: 10

Abstract Title: Examining the Influence of Sex on the Risk of Future Musculoskeletal Injury Following Sports-Related Concussion

Author(s): Stefan Bianchi¹, Michael Hutchison¹, Alex Di Battista¹

Organization/Affiliation: ¹University of Toronto

ABSTRACT:

Abstract Theme: Mild TBI / Concussion

Topic(s) of Interest: Clinical Research

Purpose of Project: The purpose of this project was to examine whether athletes have an increased risk of musculoskeletal injury following return to sport from concussion, with a specific focus on whether sex differences exist regarding this risk as this has not been adequately examined within the interuniversity athlete population.

Methods, Procedure, Results/Outcome, Conclusion: Methods: A retrospective cohort study was completed involving 392 cases of 346 interuniversity athletes at the University of Toronto between 2015-16 to 2019-20.

Procedure: Athletes who suffered a concussion during this period (CONC group, n = 98) were matched, with replacement, to an athlete who suffered an index musculoskeletal injury (MSI group, n = 98) and to two healthy control athletes (CTL group, n = 196). Participant athletes' musculoskeletal injury history for one year after returning to play were extracted from patient medical records. Generalized linear models using a Bernoulli distribution were developed to determine the difference in risk of future musculoskeletal injury between the three groups. Sex-stratified analyses were then performed using similar models to examine the presence of a potential sex difference.

Results: The CONC group had an 82% (89% compatibility interval [CI] = 76 – 88%) likelihood of suffering a musculoskeletal injury within one year following return to sport compared to 73% (89% CI = 66 – 80%) for the MSI group and 56% (89% CI = 50 – 61%) for the CTL group. This translates to a 9 percentage point difference (89% CI = -0.01 – 0.18, 93.4% probability mass [PM] > 0) between the CONC and MSI groups, a 27 percentage point difference (89% CI = 0.18 – 0.35, 100% PM > 0) between the CONC and CTL groups, and a 18 percentage point difference (89% CI = 0.09 – 0.27, 100% PM > 0) between the MSI and CTL groups. Sex-stratified analyses demonstrated that males in the CONC group had an 86% (CI = 78 – 93%) probability of future injury compared to 75% (CI = 66 – 83%) among the female athletes in the CONC group.

Conclusions: These results suggest that while concussions pose the greatest risk of future injury, musculoskeletal injuries also pose a significant risk of injury following a return to sport. Furthermore, male athletes appear at greater risk for future injury following concussion than female athletes.