

AAN 69th ANNUAL MEETING ABSTRACT

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Abstract Title: Gender Specific Outcomes and Predictors of Concussion Recovery: A Single Site 15-year Ivy League Experience

Press Release Title: Women May Be at Higher Risk for Sports-Related Concussion than Men

Objective: To determine gender differences in the incidence, symptomatology, neuropsychological testing, and return to play (RTP) length of sports-related concussion (SRC) in collegiate varsity athletes.

Authors: Cecilia Davis-Hayes, James Gossett, William Levine, Tanzid Shams, Jumpei Harada, Jeremy Mitnick, James Noble

Background: SRC is a significant public health problem with uncertain determinants of occurrence, severity, and recovery, particularly among female athletes. Collegiate SRC studies typically focus on male sports; gender-comparable studies have been limited due to small sample size, incomplete/variable follow-up, or referral bias to tertiary concussion care centers.

Design/Methods: Through a concussion care plan, from 2000-2014 Columbia University Athletics applied a standard concussion protocol to high risk athletes, including pre/post computerized neuropsychological testing, post-concussion symptom assessments, and tracked timelines. In total 1,203 athletes comprised of 822 males (68.3%) and 381 females (31.7%), were available for study.

Results: 228 athletes experienced ≥ 1 concussion during their college career, including 23.1% of females (n=88) and 17.0% of males (n=140), $p=0.01$. Both genders experienced similar symptoms following a concussion, with the exception of amnesia (males 43.6%, n= 61 vs. females 30.7%, n=27, $p=0.052$) and insomnia (males 29.3%, n=41 vs. females 42.0%, n=37, $p=0.048$). There was no significant difference between genders in post-concussion neuropsychological test performance when compared to their pre-injury baseline. Predictors of concussion included female gender (OR=1.5, 95% CI= 1.1-2.0) and prior concussion history (OR=3.0, 95% CI= 2.2-4.0); both remained significant in multivariate regression models controlling for ethnicity and medical or concussion history. Median RTP duration was 10 days for both genders. Total number of symptoms, particularly in females, remained the only significant predictor of prolonged RTP length in fully adjusted models ($\beta =0.04$, $p=0.005$).

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Conclusions: Consistent with other studies, SRC was more prevalent among females and athletes with prior concussion, but both genders experience SRC similarly in terms of symptoms, neuropsychological testing abnormalities, and RTP duration. Large collegiate research programs could offer opportunities to better understand gender-based epidemiological differences in SRC.