

78th AAN ANNUAL MEETING ABSTRACT

Media Contacts:

Renee Tessman, rtessman@aan.com, (612) 928-6137

Michelle Uher, muher@aan.com, (612) 928-6120

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Abstract Title: Youth Football and the Epidemic of Pediatric Brain Injury: Neurologic and Psychiatric Outcomes in a Multinational Cohort of 72,025 Concussions

Press Release Title: Study: Football associated with nearly one in five brain injuries in youth sports

Authors: Isaac Thorman¹, Ariel Sacknovitz¹, Aryan Malhotra¹, Michael Schubert², Fawaz Al-Mufti³, Patricia McGoldrick⁴, Carrie Muh³, Steven Wolf⁴

¹School of Medicine, New York Medical College, ²Department of Otolaryngology – Head and Neck Surgery, Johns Hopkins University School of Medicine, ³Department of Neurosurgery, Westchester Medical Center, ⁴Department of Pediatric Neurology, Boston Children's Health Physicians

Objective: To quantify the burden of football-related traumatic brain injury (TBI) in youth compared with other sports and recreational activities, and to evaluate long-term neurological and psychiatric outcomes across developmental stages.

Background: Sports-related TBI is a leading cause of long-term neurological and psychiatric morbidity in children and young adults. Football, in particular, has been implicated as a major source of injury, yet large-scale comparative studies across sports and developmental stages are limited.

Design/Methods: This retrospective cohort study used the TriNetX Research Network, encompassing >150 million patients. Children and young adults (≤ 25 years) with a first sports- or recreation-related TBI were identified using ICD-10 diagnosis and activity codes and compared with patients with lower-leg fractures from the same activity and no recorded TBI. Outcomes included repeat TBI, post-concussion syndrome, chronic headache or migraine, anxiety, mood, and substance use disorders, and suicidal ideation or behavior. Attributable risks were calculated between matched cohorts (1:1 by age category and sex). Multivariate Cox proportional hazards models adjusted for age, sex, and activity compared risks across sports.

Results: Football accounted for 19.4% of 72,025 activity-related TBIs (mean age, 13.9 years; 32% female). Repeat TBI occurred in 37% of football injuries (32% overall). Attributable risks were significantly elevated for neurological outcomes (chronic headache, 23%; visual impairment, 5%; neurodevelopmental disorders, 0.5%) and psychiatric outcomes (anxiety, 5%; depression, 3%; substance use, 1%; suicidality or violence, 0.5%). TBIs sustained at younger ages were associated with developmental and mood disorders, while those at older ages were associated with substance use disorders.

Conclusions: Football is the single leading source of pediatric sports-related TBI, associated with high recurrence and substantial neurological and psychiatric sequelae. Developmental timing of injury shapes long-term risk. Findings highlight football as a critical public health priority and support delaying tackle participation and regulating institutional promotion of youth football.