

Introduction

Very few studies have examined the prevalence of sport-related TBIs in the criminal justice system. There has been increased attention to TBI's in the world of sports. Systemic changes have been made in youth sports to reduce the occurrence of injury for example, soccer players 10 and younger are no longer permitted to head the ball (US Youth Soccer, 2016). The long-term consequences of TBI can include cognitive, social and behavioral problems, some of which can make people vulnerable to criminal justice involvement.

Research has previously not assessed the prevalence of sport-related injuries in the criminal justice system. As we better understand the scope of this issue, the importance of prevention and intervention efforts with young athletes may be heightened.

Methods

This pilot study used the TBI Implementation Grant database, DU IRB Protocol #674894-2. Study data were collected and managed using REDCap electronic data capture tools hosted at the University of Denver. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. The database includes data from 781 adult and juvenile probationers and inmates across 17 justice sites. Individuals were screened using the Ohio State University Traumatic Brain Injury Identification Method. Participants whose mechanism of injury for a TBI was identified as "fall" and elaborated with a sports-related theme such as "skiing-fell without helmet" or identified a multiple related sports injury such as "football" were captured.

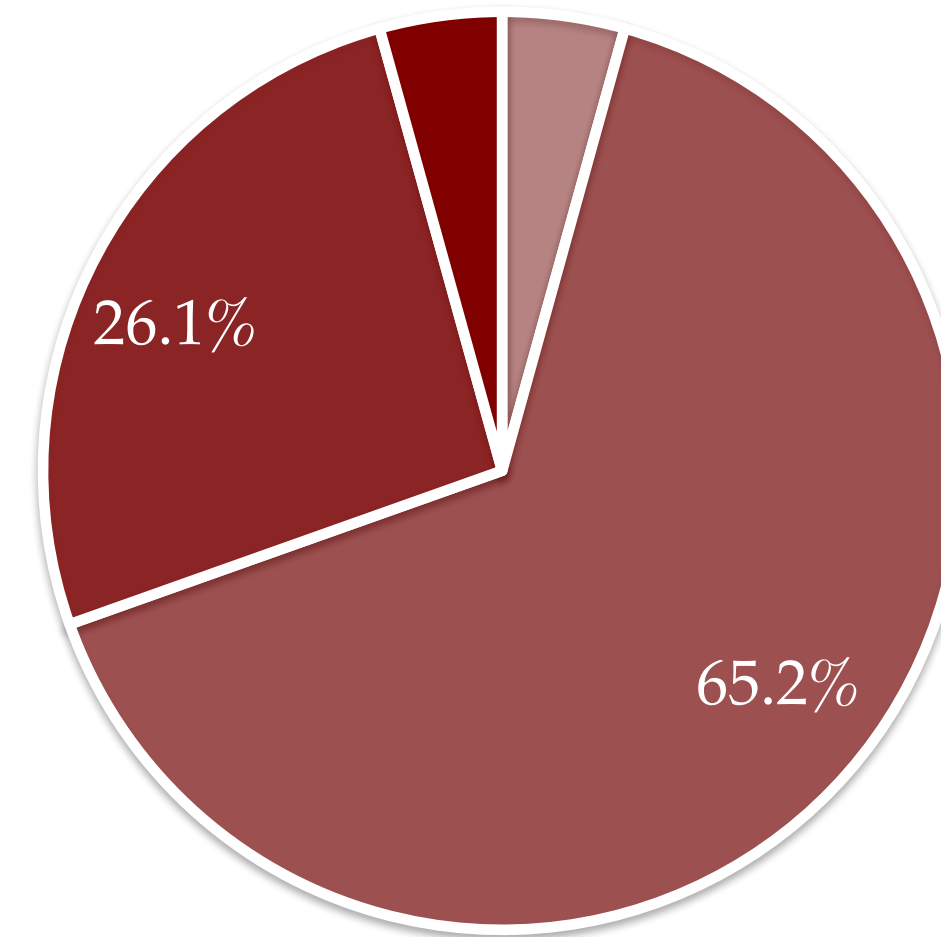
Results

Overall, 53% of individuals in this criminal justice setting have a significant TBI history, relative to less than 2% of the general population. The demographic breakdown the participants is as follows: American Indian/Alaska Native (3.9%), Asian (2, 0.3%), Native Hawaiian or Other Pacific Islander (3, 0.4%), Black or African American (12.3%), White (53.5%), Hispanic (22.7%), More Than One Race (44, 5.7%), Unknown/Not Reported (1.3%).

Results (cont.)

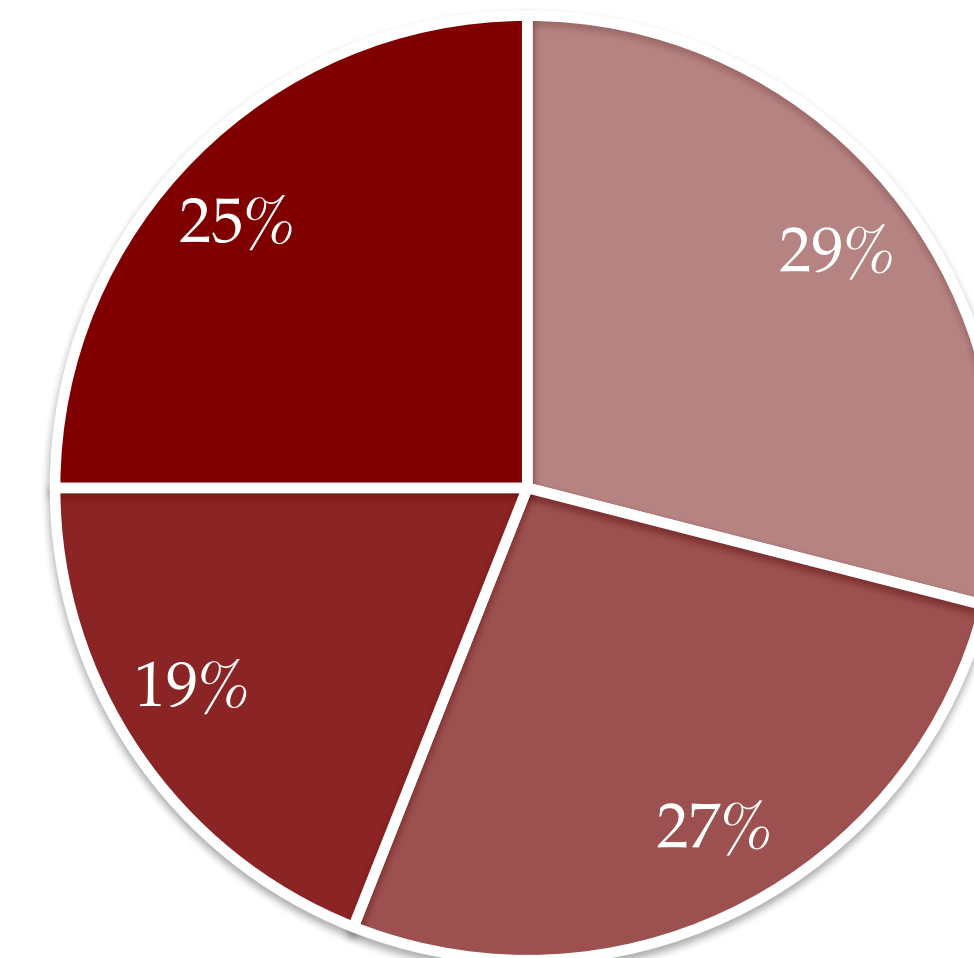
Ethnicity:

Sports-Related TBI Frequency: American Indian/Alaska Native (1, 4.3%), Asian (0, 0.0%), Native Hawaiian or Other Pacific Islander (0, 0.0%), Black or African American (0, 0.0%), White (15, 65.2%), Hispanic (6, 26.1%), More Than One Race (1, 4.3%), Unknown / Not Reported (0, 0.0%)



Criminal Convictions:

- Personal Crime
- Property Crime
- DUI/DWAI Conviction
- Drug Related Charge



Discussion

Those with a lifetime history of sport-related TBI reported more personal, property, and substance related convictions. Specifically, the rate of personal crimes is 60.9% vs. 57.9% in the general TBI population; the rate of property related crimes was 56.5% vs. 45.6% in the general TBI population; the rate of DUI/DWAI crimes was 39.1% vs. 32.4% in the general TBI population; and the rate of drug related charges was 52.2% vs. 45.6% in the general TBI population.

These preliminary data suggest the patterns of offenses for persons with sport-related TBI may be unique and warrant further study. These early results emphasize the importance of interventions to manage post-injury sequelae for athletes, specifically, drug abuse prevention.

References

Baugh, C. M., Kiernan, P. T., Kroshus, E., Daneshvar, D. H., Montenegro, P. H., Mckee, A. C., & Stern, R. A. (2015). Frequency of Head-Impact-Related Outcomes by Position in NCAA Division I Collegiate Football Players. *Journal of Neurotrauma*, 32(5), 314-326.

Bogner, J. A., & Corrigan, J. D. (2009). Reliability and validity of the OSU TBI Identification Method with Prisoners. *Journal of Head Trauma Rehabilitation*, 24(6), 279-291.

Bureau, U. C. (2015, April 18). Search Results. Retrieved September 26, 2017, from <https://www.census.gov>

Center for Disease Control and Prevention (2015). *Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation*. Nation Center for Injury Prevention and Control; Division of Unintentional Injury Prevention, Atlanta, GA.

Corrigan, J. D., & Bogner, J. A. (2007). Initial reliability and validity of the OSU TBI Identification Method. *Journal of Head Trauma Rehabilitation*, 22(6), 318-329.

Crosby, A. E., Han, B., Ortega, L. A. G., Parks, S. E., & Gfroerer, J. (2011). Suicidal thoughts and behaviors among adults aged ≥18 years – United States 2008-2009. *Center for disease Control and Prevention Morbidity and Mortality Weekly Report*. Vol. 60. No 13. Retrieved from: <http://www.cdc.gov/mmwr/pdf/ss/ss6013.pdf>

Delaney, J. S., Lamfoonk, C., Bloom, G. A., Al-Kashmiri, A., & Correa, J. A. (2015). Why University Athletes Choose Not to Reveal Their Concussion Symptoms During a Practice or Game. *Clinical Journal of Sport Medicine*, 25(2), 113-125.

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Information*, 42(2), 377-381.

Gorgens, K. (2010). Clinical interview. In B. Caplan, J. DeLuca & J. S. Kreutzer (Eds.) *Encyclopedia of Clinical Neuropsychology*. New York, NY: Springer Publishing.

Mayo Clinic. (2013). Nearly 7 in 10 Americans take prescription drugs, Mayo Clinic, Olmsted Medical Center find. Retrieved from <https://newsnetwork.mayoclinic.org>. Accessed on 29 November, 2015

Meehan, W. P., Mannix, R. C., O'Brien, M. J., & Collins, M. W. (2013). The Prevalence of Undiagnosed Concussions in Athletes. *Clinical Journal of Sport Medicine*, 23(5), 339-342.

Reeves, D., Winter, K., Bleiberg, J., & Kane, R. (2007). ANAM Genogram: Historical perspectives, description, and current endeavors. *Archives of Clinical Neuropsychology*, 22(5), p. 515-537.

Stern, R. A. & White, T. (2003). *NAB Administration, Scoring, and Interpretation Manual*. Lutz, FL: Psychological Assessment Resources.

Timonen, M., Miettunen, J., Hakko, H., Zitting, P., Veijola, J., von Wendt, L., & Räsänen, P. (2002). The association of preceding traumatic brain injury with mental disorders, alcoholism and criminality: The Northern Finland 1966 Birth Cohort study. *Psychiatry Research*, 113(3), 217-226.

US Youth Soccer Policy on Players and Playing Rules (pp. 1-8, Rep.). (2016). US Youth Soccer.

Williams, W. H., Mewse, A. J., Tonks, J., Mills, S., Burgess, C. W., & Cordan, G. (2010). Traumatic brain injury in a prison population: Prevalence and risk for re-offending. *Brain Injury*, 24(10), 1184-1188.