Are There Differences in Symptom Presentation and Recovery in Sports-related vs. Non Sports-related Pediatric Concussion?

Robert Doss¹,², PsyD, Kara Seaton², MD, Joseph Petronio¹, MD, & Rae Lyons³, BS
¹Children’s Neuroscience Center, Children’s Hospitals and Clinics of Minnesota, ²Emergency Department, Children’s Hospitals and Clinics of Minnesota, ³Minnesota Epilepsy Group, P.A.

BACKGROUND
It has been suggested that there are differences in symptom presentation and recovery in persons who suffer concussion during sport vs. those resulting from other causes (i.e., falls, blunt injury, assaults, or motor vehicle accident).

Non-sports-related concussions are thought to be associated with greater morbidity. The reasons for these differences may be secondary to injury biomechanics and patient characteristics (i.e., personality features, physical health status, motivation).

Our aim was to determine whether any differences existed in acute injury characteristics, presenting symptoms/cognitive function, and pre-morbid history in children who suffered either a sports or non-sports related concussion.

METHODS
The data collected for this project was from patients seen in the Concussion Clinic at the Children’s Hospitals and Clinics of Minnesota. We identified two groups based upon whether they were concussed as a result of a sports injury (SI, n = 188) or non-sports injury (NSI, n = 121) within the age range of 8-18.

SI was defined as a concussion resulting from a fall, blunt force injury, physical assault, or bike/motor vehicle accident.

Date of recovery was defined as the final visit date in the Concussion Clinic.

Clinical variables collected for analysis included prior concussion history, loss of consciousness (LOC) or disorientation (DIS) with presenting injury, first clinic visit ImPACT computerized cognitive testing scores (Verbal Memory Composite (VeMC), Visual Memory Composite (VisMC), Visual Motor Speed Composite (VisMoC), Reaction Time Composite (RTMC)), post-concussive symptoms (PCS), school attendance status, locus of mechanism of injury in this pediatric population.

RESULTS
Mean age for the SI and NSI groups was 13.9 and 13.4, respectively. The SI group has a statistically greater number of males than the NSI group: 67% vs. 49%.

Prior concussion history (30% vs. 25%)
Mean days from injury to first clinic visit: 12.3 (32.3) vs. 9.5 (10.6)
First clinic visit Mean PCS: 6.2 (4.2) vs. 6.7 (4.8)
LOC (17% vs. 21%) and DIS (35% vs. 35%) with presenting concussion
School attendance status at first clinic visit: (38% vs. 34% not attending)

DISCUSSION
This study demonstrated a higher rate of premorbid mental health problems, ADHD, and LD in children who suffered a non-sports-related concussion. Nevertheless, no real differences in acute injury characteristics and presenting symptoms/cognitive function were observed in those who suffered a concussion during a sport activity vs. a fall, blunt force injury, or motor vehicle accident.

Moreover, the two groups showed a very similar course of recovery regardless of mechanism of injury in this pediatric population.