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

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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 = 321) or non-sports injury (NSI, n = 121) within the age range of 9 - 18.

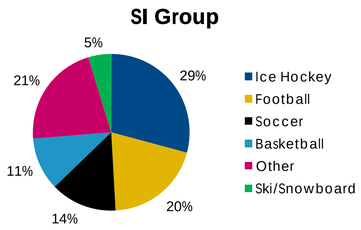
NSI was defined as a concussion resulting from a fall, blunt force injury, physical assault, or bike/motor vehicle accident.

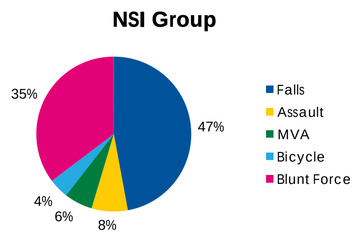
Date of recovery was defined as the final visit date in the Concussion Clinic.

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, premorbid history of attention deficit hyperactivity disorder (ADHD), learning disability (LD), or depression/anxiety (Dep/Anx).

Parametric (Independent Samples T-Tests) and non-parametric (Chi-square) statistical analyses were conducted using SPSS.

IRB approval was obtained for this project.





Group Characteristics		
	SI	NSI
N	321	121
Age at Injury	13.9 (2.3)	13.4 (2.8)
Grade	8.0 (2.3)	7.4 (2.8)
Gender (% Male)	67%	49% ***
Hx of Concussion	30%	25%
LOC w/ Presenting Injury	17%	21%
Hx of Dep/Anx	12%	23% **
Hx ADHD	14%	23% *
Hx LD	6%	18% ***

*p < .05; **p < .01; ***p < .001

1st Clinic Visit ImPACT Raw Scores		
	SI	NSI
Verbal Memory	76.3 (15.5)	77.4 (14.4)
Visual Memory	66.9 (15.4)	65.0 (15.1)
Visual Motor Speed	31.1 (8.4)	30.3 (7.8)
Reaction Time	.70 (.19)	.70 (.15)
Post-Concussive Sx Score	22.3 (19.4)	28.8 (23.6) *

*p < .05

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%.

The NSI group had a significantly higher rates of premorbid Dep/Anx, LD, and ADHD.

There were no statistically significant differences between the SI and NSI groups for the following variables:

Mean days from injury to first clinic visit: 12.3 (32.3) vs. 9.5 (10.6)

Prior concussion history (30% vs. 25%)

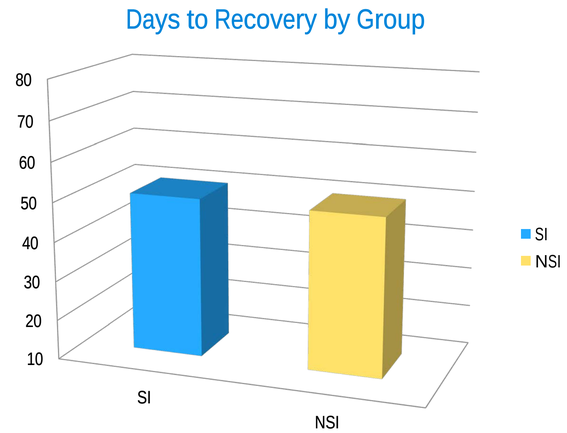
LOC (17% vs. 21%) or DIS (35% vs. 35%) with presenting concussion

First clinic visit Mean PCS: 6.2 (4.2) vs. 6.7 (4.8)

First clinic visit ImPACT scores (VeMC Mean = 76..3 vs. 77.4; VisMC Mean = 66.9 vs. 65.0; VisMoC Mean = 31.1 vs. 30.3; RTMC Mean = .70 vs. .70)

School attendance status at first clinic visit: (38% vs. 34% not attending)

Mean days to recovery: 50.4 (70.5) vs. 50.0 (60.8)



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, assault, 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.

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