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Prevalence of Soccer Heading in Middle School American Youth Club Soccer Players

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Background

- Soccer, America's most popular youth sport, carries a relatively high risk of concussion injury, and heading of the ball is recognized as a specific cause. [1]
- 1 in 5 concussions occurred by attempted purposeful heading of the ball.[2]
- In 2016, the US Soccer Federation eliminated heading during practice in games for children 10 and under and implemented limited heading during practice for children between 11-13 years of age[3].
- Parent concerns regarding headers for youth soccer players initiated the current study in a citizen-science participatory design framework

Purpose

- ~~To evaluate the prevalence of soccer heading during a season in a youth soccer club competitive team~~

Subjects

- Fifteen players from the Oceanside Breakers Soccer club (Observed team) participated in the Presidio League 2014 season, consisting of 11 weekly games of 35-minute halves in a 11x11 match format.

Methods

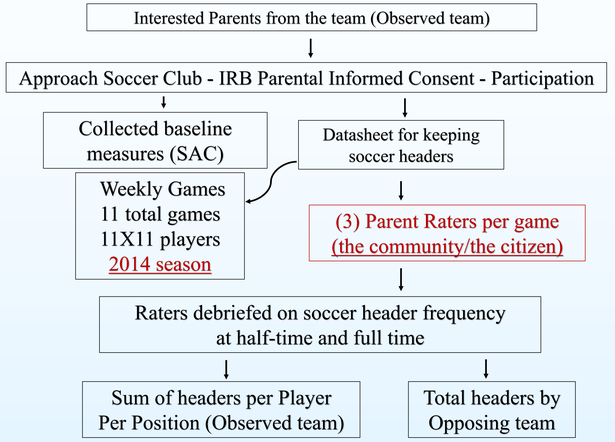

Figure 1: Schematic representation of the study design

Data Analysis

- The normality of the data was confirmed using Shapiro wilk test. Descriptive statistics was reported using Mean ± SD.
- Independent sample t test was used to find the significant difference between the observed group vs opponent group.
- A one-way ANOVA was used to find the significant difference between the forward, middle and back ward position players in the observed team.

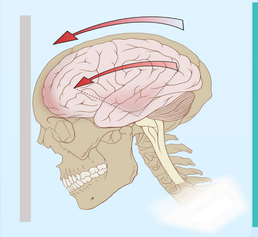

Figure 2. Illustration of the movement of the skull and brain just before impact with an object. Original image from Wikipedia.

Figure 3. Header frequency was measured as any ball-to-head impact by players.

Results

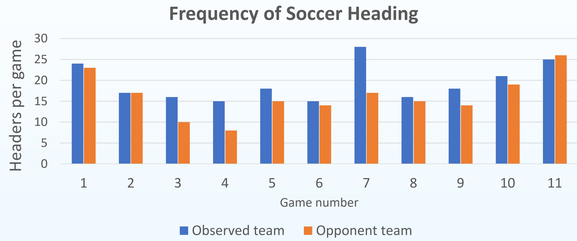

Fig 4: The number of heading occurrence in the consecutive 11 matches in both the teams.

- Occurrence in the consecutive 11 matches in both the teams are 47, 34, 26, 23, 33, 29, 45, 31, 32, 40, 51.
- The average of heading is 35.5 times/ match in a season.

Table 2. Whole season soccer heading occurrence for both the teams

Observed team (mean±SD)	Opponent team (mean±SD)	t value	p value
19.36 ± 4.47	**16.18 ± 5.19**	**1.53**	**0.139**

No Significant differences were found between the observed team vs opponent team. Mean standardized assessment of concussion (SAC) score for the observed soccer team was 24.9±2.6 (out of 30).

Table 3. Heading events at different locations of the play field (per game averages for the entire season).

Playing Position	Header frequency (mean±SD)	ANOVA results
Defense	10.34 ± 7.10	$F_{2,10}$=1.097; p=.372
Middle	18.72 ± 8.79	
Forward	14.34 ± 8.50	

No significant differences found between the number of heading events at different locations of the play field (forward, middle, and defense)

Discussion

- The current study average number of heading was 35.5 times /match is **consistent with published findings** on in U13 male soccer players[3].
- Both teams are **equally vulnerable** to the heading occurrence in the soccer match.
- A **positive trend between frequency of heading and the middle field** playing position, also agreeing with previous data[3].
- **Limitations**
  - Data did not consider individual playing time, training time and lack of anthropometric details.
- **Future research**
  - Consider playing time, player's age, race/ethnicity, length of soccer career, and previous history of sports-related concussion.
  - Investigate parents' perspective on heading frequency and the risks of concussion.

Conclusion

- High frequency of heading is observed in Middle School American Youth Club Soccer Players.
- Involvement of parents and community stakeholders is critical to translational clinical research.

References

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