

Study shows less physically mature ice hockey players have prolonged concussion symptoms

January 15 2016

A study led by a Hasbro Children's Hospital sports medicine physician found that male student ice hockey players in earlier pubertal stages had a significantly increased risk of prolonged symptoms from concussion compared with advanced pubertal and postpubescent players.

Research by Peter Kriz, M.D., found that less physically mature players took on average 54 days - 21 days or nearly 40 percent longer - to recover compared to more physically mature players. Kriz said the findings further highlight the need for student athletes in collision sports to compete with similar-aged players and that there is risk in having younger, more talented athletes "play up" on varsity teams.

"Unlike other contact-collision scholastic sports with a high incidence of concussion, high school [ice hockey](#) lacks stratification by age grouping, largely because of prohibitive costs associated with equipment, transportation and ice time incurred with fielding varsity, junior varsity and freshman teams," said Kriz. "Consequently, it's not uncommon at the varsity level for younger, less physically mature players to oppose older players with increased strength, power and speed."

The study, currently published online in *The Journal of Pediatrics*, assessed disparities in age, size, and physical maturity level among concussed adolescent ice hockey players 13 to 18 years of age, and was performed at Hasbro Children's Hospital, Boston Children's Hospital,

and South Shore Hospital, in Weymouth, Massachusetts. Additionally, the study also found that lighter weight among males and heavier weight among females increased the probability of experiencing prolonged concussion.

Concussion has been reported to be the most common youth ice hockey injury, representing more than 15 percent of all injuries in nine to 16-year-old players and nearly 25 percent of injuries among male high school players.

The study's results challenge recent opinion, which has suggested that collision sport participation be postponed until freshman year or 14 years of age. "Sixty-five percent of freshman male ice hockey players in our study were in early stages of pubertal development and none were postpubertal," said Kriz.

The findings also support concerns within the youth athletic community that adolescents might have longer recoveries from concussions than adults.

"Our findings have important implications for policy decisions related to grouping for high school ice hockey players," explained Kriz. "While economic considerations often dictate whether a school fields ice hockey teams other than varsity, we support, at the very least, the establishment of junior varsity ice hockey by state interscholastic leagues for the purposes of player development and improved safety for undersized, peripubertal male players."

Additionally, policies pertaining to high school football and boys' lacrosse—two other collision sports which commonly permit underclassmen to "play up" on varsity teams—may ultimately be impacted by these findings, as lighter, less physically mature players may be at risk of prolonged concussion symptoms.

Kriz recommends that, until further studies determine valid physical maturity indicators, arbitrary age and grade cutoffs should not be used to determine when adolescent athletes are ready to participate in collision sports.

"Until such studies are available, collision-sport [high school](#) athletes should play in leagues grouped by relative age," said Kriz. "Highly-skilled, peripubertal collision sport athletes should also be discouraged from 'playing up' at the varsity level with post-pubertal competitors three to four years their senior."

In accordance with recommendations from the American Academy of Pediatrics, Kriz encourages youth hockey organizations to provide the option of non-checking divisions for players who remain in earlier stages of pubertal development, players who are undersized, players who have significant concussion histories precluding them from participating in collision sport participation or for [players](#) 13 years old or younger seeking safer alternatives to body checking leagues.

Provided by Lifespan

Citation: Study shows less physically mature ice hockey players have prolonged concussion symptoms (2016, January 15) retrieved 17 April 2024 from <https://medicalxpress.com/news/2016-01-physically-mature-ice-hockey-players.html>

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