Study sheds light on NHL concussions

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A major University of Calgary study of concussions, conducted over seven National Hockey League seasons and led by sports medicine researchers within the Faculty of Kinesiology, indicates that while the rate of injuries leveled out over the study period, the number of days lost per concussion has increased.

The largest concussion study ever conducted in professional hockey was published today in the Canadian Medical Association Journal (*CMAJ*). It found several clinical signs and symptoms that predicted players being off the ice for more time. Headache, low energy or fatigue, memory loss , and abnormal neurological exam were significant predictors of time loss for players with concussions.

"Our results suggest that there was a trend toward a gradual increase in post-concussion time loss over the study period," said lead author Dr. Brian Benson, a researcher and physician at The Sport Medicine Centre in the University of Calgary's Faculty of Kinesiology. "More should be done to educate everyone involved about the potential adverse effects associated with continuing to play while symptomatic, failing to report symptoms to medical staff and failure to recognize or evaluate any suspected concussion."

The NHL and NHLPA have historically paved the way in professional sports for establishing comprehensive concussion surveillance and management programs. They have been prospectively and systematically collecting data since 1997 with members of the NHL/NHLPA Concussion Working Group analyzing and discussing the data on a

regular basis. The Working Group consists of physicians, neuropsychologists, former NHL players, and representatives from the league and NHL Players' Association.

Concussions are caused by traumatic force. While concussion symptoms resolve over time once injuries are identified and appropriately managed, they can be career-ending. In the United States it is estimated that roughly 1.6 to 3.8 million sports and recreation-related brain injuries take place each year.

The study looked at 559 concussions suffered by NHL players in regular season games between 1997 and 2004 and was based on physicians' reports from every team in the league.

The estimated incidence was 1.8 concussions per 1,000 player-hours. The post-concussion symptom reported most often was headache (71%), followed by dizziness (34%), nausea (24%), neck pain (23%), low energy/fatigue (22%), blurred vision (22%), amnesia (21%), and loss of consciousness (18%).

Typical time loss in days increased 2.25 times during the study period for every recurrent concussion.

"One trend we saw was that while the number of concussions leveled out over the study period, the amount of time loss appeared to gradually increase over the years—which may be an indication of either greater severity or greater caution in treatment," said Benson.

NHL regular season game concussion rates decreased from a peak of 7.7 concussions per 100 players during the 2000-2001 season to 4.9 per 100 players in 2003-2004.

"The findings also suggest that more conservative or precautionary

measures should be taken in the immediate post-concussion period, particularly when an athlete reports/experiences a post-concussion headache, low energy/fatigue, amnesia, recurrent concussion, many different postconcussion symptoms, or has an abnormal neurologic exam," conclude the authors.

The report was written by Benson along with University of Calgary colleagues Dr. Willem Meeuwisse and Dr. Jian Kang. Dr. John Rizos from the University of Toronto and Dr. Charles Burke from the University of Pittsburgh Medical Centre were also involved.

Benson said the study is valuable "not only as a good snapshot of the concussion problem in the league over a fairly long study period, but also as a source of practical information for team physicians about specific concussion signs and symptoms that we found to be significant predictors of potentially more serious concussions."

Benson and Meeuwisse are also planning to launch a world class Concussion Clinic and Clinical Research Program at The Sport Medicine Centre in the University of Calgary's Faculty of Kinesiology in the near future. The research program will serve to develop novel strategies for the assessment, management, and prevention of concussion. It will consist of a collaborative interdisciplinary team that brings together experts in Sport Medicine, Rehabilitation, Neurology, Neurosciences and Robotics. The ultimate goal of this initiative is to improve the health, social and economic outcomes for Albertans through clinical research excellence that makes a difference.

Provided by University of Calgary