Hécatombe sur la glace

Les blessures aux joueurs augmentent-elles le risque de blessure chez les membres du personnel?

Ryan P. Arbeau  Kevin E. Gordon  MD  MS  FRCPC  Glen McCurdie

RÉSUMÉ

OBJECTIF  Vérifier le nombre et la nature des blessures graves qui peuvent survenir quand les membres du personnel de soutien traversent la patinoire en direction du banc des joueurs ou vont s’occuper d’un joueur blessé sur la glace.

TYPE D’ÉTUDE  Étude hybride, série de cas et enquête

PRINCIPAUX PARAMÈTRES ÉTUDIÉS  Circonstances et nature des blessures rapportées.

RÉSULTATS  Au cours de 4 saisons, on a rapporté 988 blessures à des membres du personnels de l’équipe et de soutien, incluant 94 commotions, 5 blessures aux organes internes, 226 fractures et 86 entorses ou luxations. La plupart des blessures ont été subies par les membres du personnels de l’équipe et de soutien responsables du bien-être des joueurs (gérants, entraîneurs, thérapeutes et personnel médical d’urgence).

CONCLUSION  Les membres du personnels de l’équipe et de soutien subissent des blessures sérieuses en chutant sur la glace. Plusieurs stratégies préventives peuvent être adoptées: modification du plan de la patinoire, politique restreignant l’accès à la surface glacée et recommandations à ceux du personnel de l’équipe et de soutien qui doivent secourir les joueurs blessés sur la glace de porter des dispositifs de stabilisation de la marche.

Cet article a fait l’objet d’une révision par des pairs.

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POINTS DE REPÈRE DU RÉDACTEUR

- Chaque année, plus de 250 non-joueurs qui participent à des sports sur glace subissent des blessures importantes à la suite de chutes sur la surface glacée. Ces blessures comprennent des traumatismes orthopédiques et des commotions.
- À lui seul, le port du casque ne suffit pas à réduire le risque de blessure sur la glace. On admet généralement que le casque protège contre les traumatismes neurologiques sévères, mais son efficacité pour prévenir les commotions n’a pas été démontrée.
- Les auteurs proposent plusieurs stratégies préventives pratiques, incluant une politique interdisant de traverser la patinoire, une modification de la patinoire et des dispositifs de stabilisation de la marche largement disponibles.
Mayhem on the ice

Do players’ injuries put team staff at risk of injury?

Ryan P. Arbeau  Kevin E. Gordon MD MS FRCPC  Glen McCurdie

ABSTRACT

OBJECTIVE To investigate the potential for serious injury and the nature of injuries incurred as team staff or support personnel cross ice surfaces to get to players’ benches or to attend to injured players.

DESIGN Hybrid study, case series with survey.

MAIN OUTCOME MEASURES Circumstances and nature of reported injuries.

RESULTS Over 4 seasons, 988 injuries to team staff or support personnel were reported, including 94 concussions, 5 injuries to internal organs, 226 fractures, and 86 separations or dislocations. Most of the injuries were incurred by team staff or support personnel responsible for the welfare of players (managers, trainers, therapists, and emergency medical staff).

CONCLUSION Team staff and support personnel incur serious injuries as a result of falls on the ice. Several preventive strategies can be put in place: changes in rink design, policies restricting access to the ice surface, and encouraging team staff and support personnel who must cross the ice surface to attend to injured players to wear gait-stabilizing devices.

EDITOR’S KEY POINTS

• More than 250 non-playing participants in ice sports incur serious injuries each year as a result of falls on the ice surface. These injuries include orthopedic trauma and concussion.

• Simply wearing a helmet is not enough to reduce the risk of injury crossing the ice. Although helmets are widely recognized to protect against serious neurologic trauma, they have not been demonstrated effective at preventing concussion.

• The authors propose several practical preventive strategies, including a “no crossing the ice” policy, rink redesign, and widely available gait-stabilizing devices.

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Mayhem on the ice

There is a known risk of injury among those actively participating in team sports that take place on ice.¹ There is virtually no information on risk of injury among non-playing participants, such as coaches, managers, and other support personnel. These people are sometimes required to cross ice surfaces to access player benches or to attend to injured players. We were aware of 2 cases of team staff incurring serious injuries as a result of falls while crossing the ice, and we were concerned that these might not be isolated events. We searched the Hockey Canada Accident Database to assess the likelihood of team staff or support personnel incurring serious injuries while crossing the ice and to discover the nature of their injuries.

Case 1

During warm-up time, a ringette team manager was crossing the ice to access the players’ bench. The arena had been recently constructed (2003), and only 1 of the players’ benches was accessible from outside the ice surface. The other was accessible only by crossing the ice. A player who was skating backward saw the manager at the last second and fell while trying to stop, causing the manager to fall backward and strike her head on the ice. The manager was unconscious for a few minutes and was transferred by ambulance to a regional hospital. She had a serious occipital laceration and was diagnosed with a concussion. She reported ongoing symptoms for 6 weeks.

Case 2

A company hockey team’s coach lost his footing while walking across the ice surface. His head struck the ice and he incurred a cerebral hemorrhage. Despite neurosurgical intervention, he died from complications 10 days later.² ³ Partially as a result of his injury, a “no crossing the ice” policy was instituted in rinks in the Ottawa, Ont, area,⁴ and player benches, penalty boxes, and the timekeeper’s box were made accessible from outside the ice surface. All team staff contracted to avoid walking on the ice surface to gain access to players’ benches, penalty boxes, and timekeepers’ stations.⁵ Team staff now remain at their benches when shaking hands with players before and after games.⁴ Rink personnel and paramedics or team staff attending to injured players are required to wear helmets when crossing the ice.⁵

Hockey Canada maintains an administrative accident database for insurance purposes and for managing risk.⁶ Reporting is recommended “for each case where an injury is sustained by a player, spectator or any other person at a sanctioned hockey activity.”⁷ Injury reports are filed by team personnel within 90 days of the injury and collected by provincial and regional hockey associations. Official injury reports are entered into the accident database. The nature of, and circumstances surrounding, each injury are described.⁷ (Report forms can be found at http://members.hockeycanada.ca/downloads/insurance/English%20Injury%20Reports/Hockey%20Canada.pdf)

An anonymous subset of data from the Hockey Canada Accident Database was made available to us by Hockey Canada. The subset was limited to injuries incurred between 2001 and 2005 by team staff or support personnel with the mechanism “fall on ice.” We examined injuries incurred by “team officials” (not players, game officials, or spectators) during games (exhibition or regular season, playoff or tournament) to select occasions where team staff or support personnel were likely to be wearing street shoes on the playing surface.

The data were manipulated and analyzed in Systat,⁸ primarily as simple tables. Some of the frequency analyses are presented with data missing.

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METHOD

Hockey Canada’s database contained reports of 988 injuries resulting from falls on the ice incurred by team staff or support personnel from the middle of 2001 to the middle of 2005. The most frequent injuries, sprains or strains (n=301), accounted for 36% of all reported injuries. A remarkable number of fractures were reported (n=226). Other serious injuries included 5 injuries to internal organs and 94 concussions (11% of all injuries). Table 1 shows a summary of the number and relative frequency of all injuries. Most reported injuries (at least 92%) happened during game time (periods 1 to 3 and overtime). Where information was available on the position of the team official (n=645), we found trainers were most frequently injured (45%), followed by managers (26%), coaches (20%), hockey administrators (7%), and emergency medical staff (2%). Most of those injured (63%) were sent to hospital for assessment and management (Table 2).

RESULTS

DISCUSSION

There is a known risk of injury for those who participate in sports on ice. We found that non-playing team staff or
Table 1. Injuries incurred by team staff or support personnel as a result of “falls on ice” reported to Hockey Canada from mid-2001 to mid-2005

<table>
<thead>
<tr>
<th>TYPE OF INJURY</th>
<th>NUMBER OF INJURIES INCURRED</th>
<th>% OF ALL INJURIES*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concussion</td>
<td>94</td>
<td>10</td>
</tr>
<tr>
<td>Internal organ</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Fracture</td>
<td>226</td>
<td>23</td>
</tr>
<tr>
<td>- Skull or jaw</td>
<td>10</td>
<td>4†</td>
</tr>
<tr>
<td>- Vertebrae</td>
<td>2</td>
<td>1†</td>
</tr>
<tr>
<td>- Trunk</td>
<td>2</td>
<td>1†</td>
</tr>
<tr>
<td>- Arm</td>
<td>127</td>
<td>56†</td>
</tr>
<tr>
<td>- Leg</td>
<td>75</td>
<td>33†</td>
</tr>
<tr>
<td>- Unknown</td>
<td>10</td>
<td>4†</td>
</tr>
<tr>
<td>Separation or dislocation</td>
<td>86</td>
<td>9</td>
</tr>
<tr>
<td>Strain or sprain</td>
<td>301</td>
<td>30</td>
</tr>
<tr>
<td>Laceration</td>
<td>59</td>
<td>6</td>
</tr>
<tr>
<td>Confusion</td>
<td>75</td>
<td>8</td>
</tr>
<tr>
<td>Unknown</td>
<td>142</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>988</td>
<td>100</td>
</tr>
</tbody>
</table>

*Percentages add to slightly more than 100 due to rounding.
†Percentage of fractures.

Table 2. Positions of team officials or support personnel injured in “falls on ice” as reported to Hockey Canada

<table>
<thead>
<tr>
<th>POSITION</th>
<th>NUMBER OF FALLS</th>
<th>% OF ALL FALLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainers</td>
<td>290</td>
<td>29</td>
</tr>
<tr>
<td>Managers</td>
<td>170</td>
<td>17</td>
</tr>
<tr>
<td>Coaches</td>
<td>132</td>
<td>13</td>
</tr>
<tr>
<td>Hockey administrators</td>
<td>43</td>
<td>4</td>
</tr>
<tr>
<td>Emergency medical staff</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>343</td>
<td>35</td>
</tr>
<tr>
<td>TOTAL</td>
<td>988</td>
<td>100</td>
</tr>
</tbody>
</table>

Innovations in sport safety have significantly reduced the number of falls among elderly people. An alternative strategy for injury prevention is wearing gait-stabilizing footwear when crossing the playing surface. Improving friction at the ice-footwear interface has been shown to be important for preventing slips on ice. An recent, randomized, double-blind controlled trial found that a gait-stabilizing device (the Yaktrax Walker) greatly reduced the number of falls among elderly people. The Yaktrax Walker is an inexpensive gait-stabilizing device that fits over the sole of a shoe and uses spiral metal coils to bite into the ice. The coils do minimal damage to the ice surface.

Helmet are widely recognized to protect against head injury. Having rigorous standards for helmet design and increasing the wearing of helmets has led to reductions in the number of fatal and serious head injuries in hockey. Insisting that all rink staff, team staff, and emergency medical personnel crossing the ice wear helmets is a move toward prevention of serious neurologic trauma. Helmets have not been shown to be effective at preventing concussions, however. The large number of strains, sprains, and fractures (53% of all injuries) and concussions (10% of all injuries) we found in the Hockey Canada Accident Database constitute injuries that would not be prevented by use of helmets.

**Limitations**

Using an administrative accident database that was designed primarily for insurance and risk-management purposes is challenging for addressing clinical research questions. There have been several valuable applications of primary accident insurance data sets in the sports medicine literature, such as the relative risk of injury of various sports using Swedish Folksam Insurance data, the relative risk of knee injury of various sports using Swiss Military Insurance data, and the incidence of concussion using Ontario School Boards’ Insurance Exchange data. In all these examples, however, there...
were good data on the incidence of injuries and the population at risk.

Williamson and Goodman have shown that concussions are under-reported in the Hockey Canada database, and it is likely that other injury types are under-reported also. There might be differential reporting of more severe over less severe injuries, given the status of Hockey Canada as a supplemental insurer. We were unable to check the accuracy of the reported injuries, and we had no information on the severity of the injuries. The quality of the data was not optimal, as a lot of information was missing.

It was impossible to produce rates of injury, as we had no information on the number of either team staff or support personnel involved or on how many times they had had to cross the ice surface. In the terminology of a methodologic paper describing sports injury rates, our study is best described as a “clinical case series,” as we are reporting number and type of injuries but not the good data on the incidence of injuries and the quality of the study, in acquisition of data, and in analysis of data; helped write the initial draft; and supervised the primary author (R.P.A.). Dr McCurdie participated in acquisition of data. All authors helped to interpret data, critically revised the manuscript, and approved the final version of the manuscript.

Conclusion
Non-playing team staff and support personnel frequently fall on the ice and sustain serious injuries. Some falls can be prevented by redesigning rinks and having policies to govern behaviour (eg, Ottawa’s “no crossing the ice” policy). Many injuries seemed to occur when team staff or emergency medical personnel went onto the ice surface to attend to injured players. The most prudent preventive strategy for these injuries would appear to be the wearing of gait-stabilizing devices. Helmets offer only supplemental protection against rare catastrophic head injuries.

Contributors
Mr Arbeau participated in conception and design of the study and wrote the initial draft. Dr Gordon participated in conception and design of the study, in acquisition of data, and in analysis of data; helped write the initial draft; and supervised the primary author (R.P.A.). Dr McCurdie participated in acquisition of data. All authors helped to interpret data, critically revised the manuscript, and approved the final version of the manuscript.

Competing interests
None declared

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References