Impact of professionalism on injuries in rugby union

W M Garraway, A J Lee, S J Hutton, E B A W Russell, D A D Macleod

Abstract

Objectives—To measure the frequency and nature of injuries occurring in competitive matches since professionalism was introduced in rugby union.

Methods—The cohort study previously conducted in players from senior rugby clubs in the Scottish Borders in 1993–1994 when rugby union was an entirely amateur sport was repeated in 1997–1998. The same injury definition, outcome criteria, and method of calculating playing hours were used. In total, 803 (84%) of 960 eligible players participated, including all 30 adult players who played professionally for the Scottish Rugby Union or Border Reivers District. The 576 injury episodes in 381 of these players in competitive matches were compared with the 373 injuries in 266 players out of 975 (94%) who were eligible and registered with the same senior rugby clubs in 1993–1994. Outcomes were the occurrence of injury episodes, days away from playing or training for rugby, and time lost to employment or attendance at school/college as a consequence of being injured.

Results—The proportion of players who were injured almost doubled from 1993–1994 to 1997–1998, despite an overall reduction of 7% of the playing strength of participating clubs. Period prevalence injury rates rose in all age specific groups, particularly in younger players. This translated into an injury episode every 3.4 matches in 1993–94, rising to one in every 2.0 matches in 1997–1998. An injury episode occurred in a professional team for every 59 minutes of competitive play. Professional players sustained a higher proportion of recurrent injuries, particularly in the early part of the season. Some 56% of all their days lost to the game were caused by injuries to the muscles, ligaments, and joints of the knee, hip, and thigh.

Conclusions—The introduction of professionalism in rugby union has coincided with an increase in injuries to both professional and amateur players. To reduce this, attention should be focused on the tackle, where many injuries occur. The International Rugby Board should place a moratorium on the use of protective equipment in competitive matches until its contribution to player morbidity has been fully assessed.

Keywords: injury; professionalism; protective equipment; rugby

Professionalism was adopted by the international rugby board (IRB) after the second World Cup in South Africa in 1995. Professional players have had to adapt to the demands of increased physical and mental robustness as well as show the strength and pace expected of full time athletes. Expectations of increased standards have also filtered down to the continuing majority of amateur players. Yet little is known about the level and pattern of injuries occurring since rugby union became a professional sport. Experience is limited to a report of a New Zealand Super 12 rugby squad of 25 players, which described higher levels of injury than previously reported in first grade rugby. Garraway and Macleod conducted an epidemiological survey of rugby injuries during the 1993–1994 season when rugby union was an entirely amateur sport in Scotland. They concluded that rugby injuries constituted an important source of morbidity in young men. We now report on rugby injuries occurring during the 1997–1998 season and compare the results of this study with our previous findings.

Methods

The survey design, field staff, documentation, severity criteria, and outcome of injuries as well as the calculation of playing hours at risk were the same as in the study carried out in the 1993–1994 season. A rugby injury was defined as one sustained during a competitive match which prevented the player from training or playing rugby from the time of the injury or from the end of the match in which the injury was sustained. An injury that allowed a player to return to rugby or rugby related practice within seven days of its occurrence was classified as transient.

All 26 Scottish Rugby Union (SRU) affiliated senior rugby clubs in the Border Reivers (previously called the South of Scotland) District were invited to participate. The players from three clubs were excluded because of lack of club cooperation. Two other clubs merged at the beginning of the season. Player registration details and playing exposures were available for 803 (84%) of the 960 eligible players, including all 30 adult professionals contracted to the SRU or the Border Reivers District. Senior rugby club amateur players participated in an average of 21.8 competitive matches (22 484 hours of play) and professionals in 25.1 competitive matches (1003 hours of play) during the season. A total of 576 injury episodes occurred in 381 of the 803 players. Players in the 1993–1994 survey registered with clubs who had disbanded, merged, or who would not cooperate in the 1997–1998 survey were excluded. Thus 975 (94%) of the 1032 players who took part in the 1993–1994 survey were...
used to compare injury rates, an overall reduction of 7% in the playing strength of the 22 participating clubs. Kaplan-Meier estimates were used to calculate the median duration of absence from playing or training for rugby and time lost to employment or attendance at school or college as the result of injury in competitive matches. Injuries in both surveys were coded according to the International Classification of Diseases (ICD, 9th revision).

Results

FREQUENCY AND DISTRIBUTION

Table 1 summarises the age specific injury rates in 1993–1994 (when there were only amateur players) and 1997–1998 (for professional and amateur players). The number of hours of competitive rugby was lower in 1997–1998, particularly for players aged less than 16 years. Yet the overall proportion of players who were injured almost doubled, from 27% in 1993–1994 to 47% in 1997–1998. The rise was particularly high in teenage players. Period prevalence rates were raised in all age specific groups. The 95% confidence interval (CI) for the difference in prevalence between professional and amateur players was 29.5 to 60.9 injury episodes per 1000 player hours. Overall, these rates translate into an injury episode for every 3.4 matches in 1993–1994, rising to one in every 2.0 matches in 1997–1998. In the 1993–1994 season, new injuries predominated but this changed (table 2): 56% of all injury episodes for professional players in 1997–1998 were recurrent, compared with 29% for amateurs in 1997–1998 and 18% for all players in 1993–1994. Some 90% of all professionals were injured during the season despite participating in only 15% more hours of competitive play than amateurs. Such was the frequency of injury that a team of professional players experienced an injury episode to one of their team members for every 59 minutes of competitive play, the equivalent of 1.4 injuries per match.

Table 2  Frequency and distribution of injury episodes occurring in competitive matches according to player status

<table>
<thead>
<tr>
<th>Player status</th>
<th>1997–98 Season</th>
<th>1993–94 Season</th>
<th>New + recurrent (%)</th>
<th>Season + recurrent (%)</th>
<th>Incidence (95% CI)</th>
<th>Period prevalence (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>1997–98 Season</td>
<td>1993–94 Season</td>
<td>30 (25.1)</td>
<td>27 (90)</td>
<td>30 + 38</td>
<td>29.9 (19.4 to 40.5)</td>
</tr>
<tr>
<td>Professional</td>
<td>Senior club (amateur)</td>
<td>373 (21.8)</td>
<td>354 (46)</td>
<td>356 + 147*</td>
<td>15.8 (14.2 to 17.5)</td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>All players</td>
<td>381 (47)</td>
<td>386 (181*)</td>
<td>386 + 181*</td>
<td>16.5 (14.9 to 18.1)</td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>Senior club (amateur)</td>
<td>266 (27)</td>
<td>305 + 68</td>
<td>305 + 68</td>
<td>12.1 (10.7 to 13.4)</td>
<td></td>
</tr>
</tbody>
</table>

*N: Excluding five injury episodes where it was not known whether the injury was new or recurrent.
episodes occurred in the tackle in professional and amateur players. More professional players (37%) were injured while being tackled than amateurs (26%), particularly playing in the wing forwards and number 8 positions. In the centre and wing three quarter positions, where tackle injuries were most frequent in 1993–1994 (74%), injury episodes in the tackle fell to 50% and 53% in professionals and amateurs respectively in 1997–1998. A further change in the tackle situation involved scrum halves. In 1993–94, 9/13 (69%) scrum halves were injured while being tackled. In 1997–98, the situation had reversed, with 14/20 (70%) players in this position tackling when they were injured.

OUTCOME OF INJURIES SUSTAINED

In 1993–1994, 47/266 (18%) of injured players had not returned to playing/training by the end of the season compared with 73/353 (21%) of amateurs and 8/27 (30%) of professionals in 1997–1998. No information is available on the long term effects of the injuries or how many of these players retired from the game. If only injured players who returned to play/train before the end of the season are considered, 15 672 playing/training days were lost in 1993–1994, rising to 21 000 playing/training days lost in 1997–1998. The 1924 days lost by professionals represents 1.9 days away per player for every hour of competitive play. For amateurs, injuries to muscles, ligaments, and joints of the knee, hip, and thigh amounted to 40% and 39% of days lost in 1993–1994 and 1997–1998 respectively. In all, 1081/1924 days (56%) lost to playing/training by professionals were due to these injuries. The median time off playing/training was calculated for each injury episode. During the 1993–1994 season, the median (lower–upper quartile) was 23 (12–56) days. This was almost identical for amateurs in the 1997–1998 season. However, for professionals, the median time away from rugby was 17 (8–35) days. In 1993–1994, 97/266 players (36%) were absent from work/college as a result of rugby injuries, with median absences of 11 (5.5–25) days. This reduced to 8 (4–16) days for the 110/354 (31%) of players absent from work/college in the 1997–1998 season.

**Discussion**
The descriptive nature of the epidemiological surveys on which our findings are based do not allow firm conclusions to be drawn about the causal nature of factors associated with the occurrence of injuries. However, a number of these associations are worthy of consideration for further study. Although the number of professional players in the survey is limited compared with the much larger number of amateurs during the 1997–1998 season, the penalties for accepting the financial and other rewards accompanying professionalism in rugby union appear to include a major increase in player morbidity. Contrary to popular belief, professional players were not participating in a much higher number of competitive matches than amateurs, but, on average, an injury episode involving a professional player occurred for every 59 minutes of competitive play in which his team was involved. A higher level of recurrent injuries was observed during the early part of the season in professionals. This may be a reflection of the lack of an appropriate pre-season break from the sport because of match commitments fulfilled in the traditional close season. Overtraining or carrying existing injuries into the start of the season may have contributed. Monetary or other considerations could also explain why the median duration of absence from playing/training for professionals was lower than time spent away from the game by amateurs. On the other hand, this may be the result of better access to treatment and rehabilit-
Injuries in professional rugby union

There has been a major increase in injury rates since the introduction of professionalism in rugby union. This disturbing trend requires urgent investigation.
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