Incidence of injury in amateur rugby league sevens

T J Gabbett

OBJECTIVE

The incidence of injury was prospectively studied in 168 amateur rugby league players (from 12 teams) competing in three amateur rugby league sevens tournaments. The tournaments were played at the end (September) of three consecutive seasons (1995, 1996, and 1997) and included teams that were unsuccessful in reaching the grand final of the regular competition. Four teams competed in each tournament. All players were aged 18 years or over, and they received no payment for either training or playing. The methods and cohort of players used in this study were identical with those described previously.

Each team played three matches per tournament. A fourth match (grand final) was played by teams with the best performance during the preliminary rounds. Each match was 14 minutes long (seven minutes per half), except for the grand final, which was 20 minutes long (10 minutes per half). All matches were played on the same day. A single head trainer, employed to provide first aid coverage to all clubs in the tournaments, assessed all injuries. The head trainer held tertiary qualifications in exercise and sport science and was nationally accredited in injury prevention, assessment, and management. Although individual team trainers were permitted to enter the field freely during the course of a match, the head trainer was prevented from doing so unless summoned by the referee. Therefore, for the purpose of this study, an injury was defined as any pain or disability suffered by a player that was subsequently assessed by the head trainer during or immediately after a rugby league sevens match. Team trainers, coaches, and players were encouraged to consult the head trainer with all (including minor) injuries. All injuries sustained during matches were recorded regardless of severity. They were assessed and managed by established procedures.

Information recorded included the name of the injured player and the time, cause, anatomical site, and nature of the injury. Throughout the three tournaments, all teams were permitted a maximum of seven replacements, with no limit placed on the number of interchanges made during the match.

Injuries were classified according to the site: head and neck, face, thorax and abdomen, shoulder, arm and hand, knee, calf, ankle and foot, and “other”. Injuries were also described according to the type (nature): haematomas and strains, contusions, concussions, joint sprains, fractures and dislocations, lacerations, abrasions, and “other”. Contusions and haematomas were defined as injuries caused by direct contact to a body part.
site resulting in local damage and bleeding to that site. Contusions were characterised by minimal pain, tenderness, swelling, and no restriction of motion. Haematomas were characterised by intense pain, tenderness over a wide area, pronounced swelling, and severely restricted range of motion.

Finally, injuries were classified according to the cause: tackles (being tackled or while tackling), hitting the ground, being struck by an opposition player, falling or stumbling, overuse, overexertion, or “other”.

**Statistical analysis**

Over the three rugby league sevens tournaments, 21 matches were played. Eighteen were 14 minutes (0.23 hours) long, and the remaining three were 20 minutes (0.33 hours) long. Therefore the average duration of matches was 14.4 minutes (0.24 hours). The overall injury exposure for all players was 70.56 playing hours at risk (7 players \( \times \) 2 teams per match \( \times \) 0.24 hours \( \times \) 21 matches). Expected injury rates (tables 1 and 2) were calculated as described by Hodgson Phillips et al.

A one sample \( \chi^2 \) test was used to determine whether the observed injury frequency was significantly different from the expected injury frequency. The level of significance was set at \( p < 0.05 \).

**RESULTS**

Over the three rugby league sevens tournaments, 20 injuries were recorded, with an overall incidence of injury of 283.5 (95% confidence intervals (CI) 173.2 to 436.6) per 1000 playing hours. In the 1995, 1996, and 1997 tournaments the numbers of injuries were 4 (20%), 5 (25%), and 11 (55%) respectively (table 1). All of the injuries sustained were new.

The overall injury exposure for each tournament was 23.52 playing hours at risk. The most common sites of injury were the knee (56.7 (95% CI 15.4 to 145.2) per 1000 hours, 20%) and face (56.7 (95% CI 15.4 to 145.2) per 1000 hours, 20%) (fig 1). Some 40% (113.4 (95% CI 48.9 to 223.4) per 1000 hours) of the injuries sustained were to the lower limb (knee, 56.7 (95% CI 15.4 to 145.2) per 1000 hours, 20%; ankle and foot, 42.5 (95% CI 8.8 to 124.1) per 1000 hours, 15%; calf, 14.2 (95% CI 0.4 to 79.1) per 1000 hours, 5%). Injuries to the upper limb (42.5 (95% CI 8.8 to 124.1) per 1000 hours, 15%) were less common (\( \chi^2 = 5.3, df = 1, p < 0.05 \)).

Figure 2 shows the nature of injuries sustained. Contusions were the most common type (113.4 (95% CI 48.9 to 223.4) per 1000 hours, 40%), followed by joint sprains (85.0 (95% CI 31.2 to 185.3) per 1000 hours, 30%) and lacerations (56.7 (95% CI 15.4 to 145.2) per 1000 hours, 20%) (\( \chi^2 = 9.5, df = 4, p < 0.05 \)). Of the 20 injuries sustained, none were muscular haematomas or strains.

**Table 1** Observed and expected injuries for the first (1995), second (1996), and third (1997) amateur rugby league sevens tournament

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**Table 2** Observed and expected injuries for the first, second, third, and fourth matches played during the amateur rugby league sevens tournaments

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**Figure 1** Site of injury in rugby league sevens.

**Figure 2** Nature of injury in rugby league sevens.

**Figure 3** Cause of injury in rugby league sevens.
Most (198.4 (95% CI 108.3 to 333.3) per 1000 hours, 70%, \( \chi^2 = 31.5, \) df =4, \( p<0.001 \)) injuries occurred in physical collisions and tackles (being tackled, while tackling, direct contact with ground, or struck by opposition player), with no differences found between tackled (70.9 (95% CI 23.0 to 165.2) per 1000 hours, 25%) and tackling (70.9 (95% CI 23.0 to 165.2) per 1000 hours, 25%) players. Overuse injuries were uncommon (14.2 (95% CI 0.4 to 79.1) per 1000 hours, 5%) (fig 3).

An increasing injury incidence was observed over the first (99.2 (95% CI 12.0 to 358.1) per 1000 hours), second (198.4 (95% CI 54.0 to 507.9) per 1000 hours), third (347.2 (95% CI 139.2 to 715.2) per 1000 hours), and fourth (694.4 (95% CI 278.5 to 1430.5) per 1000 hours) matches played during the tournaments (\( \chi^2 = 9.2, \) df = 3, \( p<0.05 \)) (fig 4).

**DISCUSSION**

This study found that collisions, tackles, and contact were the most common causes of injury in rugby league sevens, followed by falls and direct contact with the ground. Most injuries occurred in the final tournament, with a higher incidence of injury during the same time period for the conventional rugby league season (1995–1997). The incidence of injury increased significantly with the playing of successive matches. The results suggest that there is a higher incidence of injury in rugby league sevens compared to conventional rugby league.

The finding that 40% of all injuries were to the lower limb is consistent with previous studies. Injuries to the lower limb are common in rugby league, and this finding highlights the importance of addressing these injuries in amateur rugby league sevens.

Injuries to the head and neck are also significant in rugby league sevens, and the higher incidence of head injuries in the final match of the tournament suggests that fatigue may play a role in increasing the risk of head injuries.

The finding that the overall injury rate of 283.5 injuries per 1000 playing hours is higher than previous studies is also consistent with the findings of previous studies. The higher injury rate in rugby league sevens may be due to the repetitive nature of the sport, with players competing repeatedly throughout the day.

In conclusion, the findings of this study suggest that rugby league sevens has a higher incidence of injury than conventional rugby league, particularly during the final match of the tournament. The results also highlight the importance of addressing injuries to the lower limb and head and neck in amateur rugby league sevens.
Take home message

This study found a high incidence of injury in amateur rugby league sevens players. The incidence of injury increased significantly with the playing of successive matches. Fatigue may contribute to injuries in amateur rugby league sevens players.

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REFERENCES


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