



International Rugby Board

Surveillance Studies

Women's Sevens Challenge Cup

Women's Sevens World Series

Rugby World Cup Sevens (Women)

Summary of Results: 2011 to 2013

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1 Introduction

The IRB is committed to implementing surveillance studies (SS) at all major IRB Tournaments and to disseminate the results within the Rugby community. The aims of these studies are to record and analyse injuries and illnesses sustained by male and female players at individual Tournaments, to identify changing patterns of injury and to bring injury-related areas of concern to the attention of the IRB Chief Medical Officer.

There have been no previous reports related to the injury epidemiology for Women's Rugby Sevens: this review therefore provides the first analysis of injuries sustained in international women's Rugby Sevens.

2 Methods

All studies were conducted in accordance with the definitions and protocols described in the IRB approved consensus statement on definitions and procedures for injury surveillance studies in rugby union (Fuller et al., 2007).

The definition of injury was: *'Any injury sustained during a Women's Seven's Challenge Cup, Sevens World Series or Rugby World Cup Tournament match that prevents a player from taking a full part in all normal training activities and/or match play for more than one day following the day of injury'*. Incidents where a player's absence from match play and/or training was caused by training activities, illness or other medical conditions not related to a Seven's Challenge Cup, Sevens World Series or Rugby World Cup Sevens match were not included. A recurrent injury was defined as: *'An injury (as defined above) of the same type and at the same site as an index injury and which occurs after a player's return to full participation from the index injury'*. Injuries were classified using the appropriate OSICS 8 Code (Orchard, 1995). Injury location, type and cause together with the event leading to the injury were also recorded.

Injury severity was determined by the number of days a player was injured. A player was deemed to be 'injured' until she could undertake full normal training and be available for match selection, whether or not she was actually selected. Medical staff were required to make an informed clinical judgement about a player's fitness to train/play on those days when players were not scheduled to train or play. Injured players were followed after each Tournament to obtain their return to play date.

The complete lists of categories and sub-categories used for injury locations and injury types are provided in the rugby injury consensus publication (Fuller et al., 2007).

Differences in players anthropometric data were assessed using unpaired t-tests; differences in the incidences, mean severity and proportions of injuries were assessed using z-tests and differences in median severity using a Mann-Whitney U test. Statistical significance was accepted at the $p=0.05$ level, although it is recognised that this could identify some differences that occur by chance due to the number of statistical comparisons being made in the study.

3 Data collection

At the beginning of each Seven's Challenge Cup, Sevens World Series and Rugby World Cup Sevens, the team's medical staff explained to each squad player the purpose of the epidemiological study. Each player's baseline anthropometric information was recorded on a Player Baseline Information Form (playing position [back, forward]; age; body mass; stature); players joining a team's squad at a later date were added to the team's list of players and the anthropometric data recorded at the time the player joined the squad.

A member of the team's medical staff recorded every match injury sustained during a Seven's Challenge Cup, Sevens World Series or a Rugby World Cup (RWC) Sevens match on a Tournament Summary of Injuries Report Form, which was returned to the study co-ordinator at the end of the Tournament. A member of the team's medical staff also recorded information about each injury on an Injury Report Form (date of injury, date of return to play, location and type of injury, cause of injury, event leading to injury). Injury Report Forms were returned to the study co-ordinator when the final piece of information had been entered on the Injury Report Form (normally the date that the player returned to normal training/match play).

4 Results

In 2011/12, the Women's Sevens Challenge Cup consisted of three tournaments in Dubai (2 – 3 December 2011), Hong Kong (23 – 24 March 2012) and England (12 – 13 May 2012): this study recorded players' anthropometric data and injuries sustained by 8 of the 16 teams involved (Australia, Canada, England, Netherlands, Portugal, South Africa, Spain, USA). In 2012/13, the Women's Series World Series consisted of four Tournaments in Dubai (30 November – 1 December 2012), USA (1 – 2 February 2013), China (30 – 31 March 2013) and Netherlands (17 – 18 May 2013) together with the Women's RWC Sevens in Russia (29 – 30 June 2013): the study recorded players' anthropometric data and match injuries sustained by 7 of the 12 teams involved (Australia, Canada, England, Netherlands, New Zealand, South Africa, USA). In both 2011/12 and 2012/13 not all teams took part in all individual tournaments.

All results are reported as the average of the 2011/12 Sevens Challenge Cup, 2012/13 Series and the 2013 RWC, as the numbers of injuries in each event are too small to provide meaningful results on their own.

4.1 Players' anthropometric data

Table 1 summarises the numbers and anthropometric data for players categorised as backs, forwards and all players during 2011/12 and 2012/13.

Forwards are significantly older ($p < 0.001$), heavier ($p < 0.001$) and taller ($p < 0.001$) than backs. Compared to players in the men's series, players in the women's series are older ($p < 0.001$) and, as expected, lighter ($p < 0.001$) and shorter ($p < 0.001$).

Table 1: Players' anthropometric data.

| Series / Measure | Mean (Standard deviation, number of players) | | |
|---------------------------------------|--|------------------|------------------|
| | Backs | Forwards | ALL players |
| All Series (2011/12 – 2012/13) | | | |
| Stature, cm | 166.0 (5.6, 149) | 170.4 (6.4, 107) | 167.9 (3.7, 260) |
| Body mass, Kg | 65.1 (6.2, 150) | 71.6 (6.2, 109) | 67.8 (7.0, 259) |
| Age, years | 23.9 (3.7, 151) | 25.4 (3.5, 109) | 24.5 (3.7, 260) |

4.2 Match injuries

4.2a Incidence of injury

Table 2 summarises the number of match injuries sustained, match exposure and incidence of match injuries for backs, forwards and all players.

Table 2: Number, match exposure (player-hours) and incidence (injuries/1000 player-match-hours, 95% confidence interval) of match injuries.

| Series / Measure | Backs | Forwards | ALL players |
|---------------------------------------|----------------------|---------------------|----------------------|
| All Series (2011/12 – 2012/13) | | | |
| Injuries | 34 | 15 | 49 |
| Exposure | 258.6 | 193.9 | 452.5 |
| Incidence | 131.5 (94.0 – 184.0) | 77.3 (46.6 – 128.3) | 108.3 (81.8 – 143.3) |

Despite the large difference in the incidences of injury for backs and forwards, the difference does not reach statistical significance ($p=0.087$) due to the relatively small number of injuries recorded at this stage. The incidences of injury for women are very similar to those recorded for men (backs: 114.4; forwards: 94.8; all players: 106.0) with no statistically significant differences (Fuller and Taylor, 2013).

4.2b Severity of injury

Table 3 summarises the mean and median severities of injuries for backs, forwards and all players.

Table 3: Mean and median severity of match injuries.

| Series / Measure | Severity (95% Confidence interval), days | | |
|---------------------------------------|--|---------------------|--------------------|
| | Backs | Forwards | ALL players |
| All Series (2011/12 – 2012/13) | | | |
| Mean | 61.0 (38.5 – 83.6) | 87.2 (37.5 – 136.9) | 69.0 (47.3 – 90.8) |
| Median | 38 (15 – 70) | 51 (12 – 105) | 40 (20 – 61) |

There are no statistically significant differences in the mean or median severities of injuries sustained by backs and forwards. Although both the mean and median

severities of injuries sustained by women are higher than those reported for men (Fuller and Taylor, 2013), the differences do not reach statistical significance.

4.2c Location of injury

Table 4 summarises the locations of injuries sustained by backs, forwards and all players.

Table 4: Locations of match injuries.

| Series / Location of injury | % (95% Confidence interval) | | |
|---------------------------------------|-----------------------------|--------------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| Head/neck | 23.5 (9.3 – 37.8) | 26.7 (4.3 – 49.0) | 24.5 (12.4 – 36.5) |
| Head/face | 23.5 (9.3 – 37.8) | 26.7 (4.3 – 49.0) | 24.5 (12.4 – 36.5) |
| Neck/cerv ^l spine | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Upper limbs | 8.8 (0 – 18.4) | 20.0 (0 – 40.2) | 12.2 (3.1 – 21.4) |
| Shoulder/clavicle | 2.9 (0 – 8.6) | 6.7 (0 – 19.3) | 4.1 (0 – 9.6) |
| Upper arm | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Elbow | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Forearm | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Wrist | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Hand/fingers | 5.9 (0 – 13.8) | 13.3 (0 – 30.5) | 8.2 (0.5 – 15.8) |
| Trunk | 8.8 (0 – 18.4) | 13.3 (0 – 30.5) | 10.2 (1.7 – 18.7) |
| Ribs/upper back | 5.9 (0 – 13.8) | 13.3 (0 – 30.5) | 8.2 (0.5 – 15.8) |
| Abdomen | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Low back | 2.9 (0 – 8.6) | 0.0 (-) | 2.0 (0 – 6.0) |
| Sacrum/pelvis | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Lower limbs | 58.8 (42.3 – 75.4) | 40.2 (15.2 – 64.8) | 53.1 (39.1 – 67.0) |
| Hip/groin | 2.9 (0 – 8.6) | 0.0 (-) | 2.0 (0 – 6.0) |
| Thigh, posterior | 2.9 (0 – 8.6) | 6.7 (0 – 19.3) | 4.1 (0 – 9.6) |
| Thigh, anterior | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Knee | 17.6 (4.8 – 30.5) | 26.7 (4.3 – 49.0) | 20.4 (9.1 – 31.7) |
| L-Leg/Achilles | 14.7 (2.8 – 26.6) | 0.0 (-) | 10.2 (1.7 – 18.7) |
| Ankle | 14.7 (2.8 – 26.6) | 6.7 (0 – 19.3) | 12.2 (3.1 – 21.4) |
| Foot/toe | 5.9 (0 – 13.8) | 0.0 (-) | 4.1 (0 – 9.6) |

The majority of injuries sustained by both backs (58.8%) and forwards (40.2%) were located in the lower limbs. Overall, the head/face (23.5%), knee (17.6), lower leg/Achilles (14.7%) and ankle (14.7%) were the most vulnerable locations for backs while for forwards the most vulnerable locations were the knee (26.7%), head/face (26.7%), hand/fingers (13.3%) and ribs/upper back (13.7%).

4.2d Type of injury

Table 5 summarises the types of injuries sustained by backs, forwards and all players.

The majority of injuries sustained by backs (47.3%) and forwards (40.0%) were joint (non-bone)/ligament injuries. For backs, sprain/ligament (44.1%), fractures

(14.7%) and concussion (14.7%) were the most common types of injuries; while, for forwards, the most common injuries were sprain/ligament (33.3%), fracture (26.7%), muscle rupture/strain/etc (13.3%) and haematoma (13.3%) were the most common injuries.

Table 5: Types of match injuries.

| Series / Type of injury | % (95% Confidence interval) | | |
|---|-----------------------------|--------------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| Bone | 17.6 (4.8 – 30.5) | 26.7 (4.3 – 49.0) | 20.4 (9.1 – 31.7) |
| Fracture | 14.7 (2.8 – 26.6) | 26.7 (4.3 – 49.0) | 18.4 (7.5 – 29.2) |
| Other bone | 2.9 (0 – 8.6) | 0.0 (-) | 2.0 (0 – 6.0) |
| CNS/PNS | 14.7 (2.8 – 26.6) | 0.0 (-) | 10.2 (1.7 – 18.7) |
| Concussion | 14.7 (2.8 – 26.6) | 0.0 (-) | 10.2 (1.7 – 18.7) |
| Nerve | 0.0 (-) | 0.0 (-) | 0.0 (-) |
| Joint (non-bone)/lig^t | 47.1 (30.3 – 63.8) | 40.0 (15.2 – 64.8) | 44.9 (31.0 – 58.8) |
| Dislocation/sublux ⁿ | 0.0 (-) | 6.7 (0 – 19.3) | 2.0 (0 – 6.0) |
| Lesion meniscus | 2.9 (0 – 8.6) | 0.0 (-) | 2.0 (0 – 6.0) |
| Sprain/ligament | 44.1 (27.4 – 60.8) | 33.3 (9.5 – 57.2) | 40.8 (27.1 – 54.6) |
| Muscle/tendon | 17.6 (4.8 – 30.5) | 26.7 (4.3 – 49.0) | 20.4 (9.1 – 31.7) |
| Haematoma/etc | 8.8 (0 – 18.4) | 13.3 (0 – 30.5) | 10.2 (1.7 – 18.7) |
| Muscle rupture/etc | 5.9 (0 – 13.8) | 13.3 (0 – 30.5) | 8.2 (0.5 – 15.8) |
| Tendon injury/etc | 2.9 (0 – 8.6) | 0.0 (-) | 2.0 (0 – 6.0) |
| Skin | 2.9 (0 – 8.6) | 6.7 (0 – 19.3) | 4.1 (0 – 9.6) |
| Laceration | 2.9 (0 – 8.6) | 6.7 (0 – 19.3) | 4.1 (0 – 9.6) |

CNS/PNS: Central and peripheral nervous systems

4.2e Most common and highest risk injuries

The most common specific injuries sustained by backs were concussion (14.7%), knee MCL sprain (8.8%), tibia/fibula fractures (8.8%) and inferior tibia-fibula syndesmosis injury (8.8%). For forwards, the most common injury was an anterior cruciate ligament injury (13.3%); all other injuries occurred only once.

For backs, the injuries causing the greatest number of days absence were tibia/fibula fractures (24.4%), Achilles tendon injuries (14.5%) and inferior tibia-fibula syndesmosis injuries (13.7%). For forwards, the highest risk injuries were anterior cruciate ligament injuries (43.1%), malleolus fractures (17.4%) and clavicle fractures (8.0%).

4.2f Nature of onset of injury

Table 6 summarises the nature of onset of injuries sustained by backs, forwards and all players.

Ninety-eight per cent of all injuries sustained were acute in nature.

Table 6: Nature of injury-onset of match injuries.

| Series / Nature of onset | % (95% Confidence interval) | | |
|---------------------------------------|-----------------------------|-----------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| Acute | 97.1 (91.4 – 100) | 100 (–) | 98.0 (94.0 – 100) |
| Gradual | 2.9 (0 – 8.6)) | 0.0 (–) | 2.0 (0 – 6.0) |

4.2g Cause of onset of injury

Table 7 summarises the cause of onset of injuries sustained by backs, forwards and all players. Almost ninety per cent of all injuries were the result of contact activities.

Table 7: Cause of onset of injury.

| Series / Cause of onset | % (95% Confidence interval) | | |
|---------------------------------------|-----------------------------|-------------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| Contact | 87.9 (76.7 – 99.0) | 93.3 (80.7 – 100) | 89.6 (80.9 – 98.2) |
| Non-contact | 12.1 (1.0 – 23.3) | 6.7 (0 – 19.3) | 10.4 (1.8 – 19.1) |

4.2h Match events leading to injury

Table 8 summarises the specific match activities causing the injuries sustained by backs, forwards and all players.

Table 8: Match events leading to injury: Sevens World Series 2008/09 – 2012/13.

| Series / Cause of onset | % (95% Confidence interval) | | |
|---------------------------------------|-----------------------------|--------------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| Collision | 5.9 (0 – 13.8) | 13.3 (0 – 30.5) | 8.2 (0.5 – 15.8) |
| Ruck | 5.9 (0 – 13.8) | 0.0 (–) | 4.1 (0 – 9.6) |
| Running | 8.8 (0 – 18.4) | 6.7 (0 – 19.3) | 8.2 (0.5 – 15.8) |
| Tackled | 44.1 (27.4 – 60.8) | 40.0 (15.2 – 64.8) | 42.9 (29.0 – 56.7) |
| Tackling | 26.5 (11.6 – 41.3) | 40.0 (15.2 – 64.8) | 30.6 (17.7 – 43.5) |
| Other | 8.8 (0 – 18.4) | 0.0 (–) | 6.1 (0 – 12.8) |

Being tackled (44.1%) and tackling (26.5%) are the events responsible for the most injuries to backs; being tackled (40.0%) and tackling (40.0%) are also the events responsible for most injuries to forwards.

4.2i Time of injury

Table 9 provides a summary of the period in a match when injury events take place as a function of playing position.

Table 9: Time during matches of injuries sustained in the period 2008/09 to 2012/13.

| Time of injury, min | % (95% Confidence interval) | | |
|---------------------------------------|-----------------------------|--------------------|--------------------|
| | <i>Backs</i> | <i>Forwards</i> | <i>ALL players</i> |
| All Series (2011/12 – 2012/13) | | | |
| First half | 45.5 (28.5 – 62.4) | 33.3 (9.5 – 57.2) | 41.7 (27.7 – 55.6) |
| Second half | 54.5 (37.6 – 71.5) | 66.7 (42.8 – 90.5) | 58.3 (44.4 – 72.3) |

There are no statistically significant differences in the proportions of injuries sustained during the first and second halves for either backs or forwards.

5 Discussion

Because of the limited player exposure experienced during the two Series of Women's Rugby Sevens it is too early to generalise the results reported here: this is expressly shown by the wide 95% confidence intervals reported for the various parameters. However, despite this it is already possible to establish that the incidence and severity of injury in women's Rugby Sevens are similar in magnitude to those observed in men's Rugby Sevens. It is also possible to establish that the incidence of injury in women's Rugby Sevens is significantly higher than that reported for women's 15-a-side Rugby (Taylor et al., 2011).

6. References

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