Injury Surveillance Studies

2024 Rugby 7´s Europe Championship (Men)

Dec 2024

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1. INTRODUCTION

Understanding the incidence and nature of the injuries sustained during the practice of rugby is key in order to clarify the risks posed to players. Due to its nature as a contact sport, rugby, as well as ice hockey, lacrosse, and American football, has a higher injury incidence than non-contact sports. Through Injury Surveillance Studies in various competitions, it is possible to gain an understanding of how, where and when injuries happen, which is a fundamental requirement to advance player welfare standards across all ages and levels of the game.

Several injury surveillance studies have been previously implemented in World Rugby [1–3] and Rugby Europe 7s competitions (Rugby 7s Olympic Qualifier [Men & Women]).

Rugby Europe is committed to implementing injury surveillance studies at all major Rugby Europe tournaments and to disseminate the results within the Rugby community.

The general aims of these studies are:

- To record and analyze injuries sustained at Rugby Europe competitions.
- To identify injury trends in Rugby 7s and Rugby 15s.
- To bring injury-related areas of concern to the attention of Rugby Europe's Chief Medical Officer and when appropriate to World Rugby's Chief Medical Officer.

This report continues the on-going study of Rugby Europe competitions by reporting injuries sustained during the Men's Rugby Europe 7s Championship 2024.

2. METHODS

The study was conducted in accordance with the definitions and protocols described in the World Rugby approved consensus statement on definitions and procedures for injury surveillance studies in Rugby[4].

The definition of injury was: Any injury sustained during the Men's 7s Rugby Europe Championship (REC) 2024 matches 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'. 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'.

Specific injuries were classified using the OSICS 10 coding system[5]. 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 he/she could undertake full, normal training and be available for match selection whether he/she was actually selected. Medical staff were informed to make an informed clinical judgment about a player's fitness to train/play on those days when players were not scheduled to train or play. Injured players were followed up after each tournament to obtain their return-to-play date: the return-to-play dates for players with injuries that remained unresolved 3 months after the final Tournament in the Men´s 7s REC 2024 were defined on the basis of the player's medical staff's judgment and prognosis. The complete lists of categories and sub-categories used for categorizing injury location and injury types are provided in the Rugby consensus publication[4].

Only match injuries resulting in > 1 day of absence from training or match play were recorded in this study. The rest of the injuries that were not included in this definition were not recorded.

3. DATA COLLECTION

Prior to the tournament taking place, the purpose of the epidemiological study was outlined to each participating team. Each player's baseline anthropometric information was recorded: (playing position [back, forward]; date of birth; body mass [Kg]; stature [cm]); players joining a country's squad at a later date were added to the list of players and the anthropometric data recorded at the time the player joined the squad.

Medical staff prospectively recorded match injuries sustained during the tournament. A member of the team's medical staff also recorded detailed information about each injury (date of injury, date of

return to play, location and type of injury, cause of injury, event leading to injury). The final piece of information recorded is normally an injured player's return-to-play date.

Belgium, Croatia, France, Georgia, Germany, Great Britain, Ireland, Italy, Lithuania, Portugal, Spain, and Ukraine were involved in the Men's 7s REC 2024.

4. RESULTS

All participating teams reported data in accordance with the definitions and protocols described in the World Rugby approved consensus statement on definitions and procedures for injury surveillance studies in Rugby[4].

4.1. Players' anthropometric data

Table 1 summarises the numbers and anthropometric data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024. The total sample population involved in the study was 197 players; anthropometric data were provided for 109 players.

The total sample population for the study was 197 players (56 backs; 53 forwards; 88 unknown). The mean age was 25,1 years (backs: 25,4 years; forwards: 25,0 years; p =0,549). The average age has been calculated among the 85 players for whom we have all anthropometric data, although age has been reported by all players without identifying their playing position, with the average age for the entire sample being: 24,8 years. The average stature for all players was 183,1 cm; forwards (185,3 cm) were significantly taller than backs (181,0 cm) (p<0,001). The average body mass for all players was 88,0 kg; forwards (91,7 kg) were significantly heavier than backs (84,4 kg) (p<0,001).

Table 1. Players' anthropometric data

Measure	Mean (± standard deviation)		
	Backs	Forwards	All players
Players (n)	56	53	109
Stature (cm)	181,0 (5,0)	185,3 (5,7)	183,1 (5,8)
Body Mass (kg)	84,4 (7,7)	91,7 (8,1)	88,0 (5,8)
Age (years)	25,4 (3,9)	25,0 (3,7)	25,1 (4,1)

4.2. Match injuries

4.2.1. Injury incidence

Table 2 summarises the match injury frequency and incidence and match exposure data for players, categorised as backs, forwards and all players, taking part in Men's 7s REC 2024.

The total number of injuries sustained was 29 (backs: 17; forwards: 12) and the total match exposure was 222 player-hours (backs: 127; forwards: 95). The overall match incidence was 130,6 injuries/1000 match hours (backs: 133,9; forwards: 126,3).

Table 2. Match injury frequency, exposure, and injury incidence			
Measure	Backs	Forwards	All players
Injuries (n)	17	12	29
Exposure (player-match-hours)	127	95	222
Incidence (95% confidence interval)	133,9 (74,6-193,1)	126,3 (59,5-193,1)	130,6 (86,3-175,0)

4.2.2. Injury severity

Table 3 summarises the mean and median match injury severity data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The mean severity of all injuries sustained was 34,0 days missed (backs: 35,2 days; forwards: 32,6 days). The median severity of all injuries sustained was 23,0 days for all players (backs: 21,0 days; forwards: 27,5 days). There were no significant differences between backs and forwards for either the mean (p= 0,305) or median severities (p=0,580).

Table 3. Mean and median match injury severity (days lost)			
Measure	Severity (95% Confidence interval), days		
	Backs	Forwards	All players
Mean (95% confidence interval)	35,2 (18,4-52,0)	32,6 (20,6-44,5)	34,0 (23,7-44,4)
Median (95% confidence interval)	21,0 (2,0-93,0)	27,5 (9,0-62,0)	23,0 (2,0-93,0)

Table 4 summarises the proportion of match injuries by time-loss data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

Moderate severity (8-28 days) injuries were the most common representing 44,8% of all injuries, followed by severe (29-90 days) with 41,4%, minor (2-7 days) with 10,3% and major (>90 days) with 3,4%. Forwards sustained the same level of moderate (8-28 days) and severe (9-29 days) (50,0%) injuries, while the most injuries sustained by backs were moderate (8-28 days) injuries (41,2%).

Table 4. Proportion of match injuries by time-loss category			
Measure	%		
	Backs	Forwards	All players
Minor (2-7 days)	17,6	0,0	10,3
Moderate (8-28 days)	41,2	50,0	44,8
Severe (29-90 days)	35,3	50,0	41,4
Major (>90 days)	5,9	0,0	3,4

4.2.3. Injury burden

The total days-absence resulting from match injuries sustained during the Men´s 7s REC 2024 was 987 days-absence (backs: 599; forwards: 388).

Injury burden, which is equal to injury incidence x mean severity, is an important ISS output measure, as it provides an overall indication of the risk of injury[6,7]. The injury burden in the REC 2024 was 4440 days lost/1000 player-hours (backs: 4713; forwards: 4029 days lost).

4.2.4. Injury location

Table 5 summarises the proportion of match injuries by injury location data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024. The most common anatomic location for all players was head/neck with 44,8%, followed by lower limb and upper limb (24,1%).

Head/face was the most common specific injury location with 41,4% followed by shoulder/clavicle (17,2%). For backs and forwards, the most frequent injury location was the head/face (41,1% backs, 41,7% forwards) followed by the shoulder/clavicle (17,6% backs, 16,7% forwards).

Table 5. Proportion of match injuries by injury location			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
Head / Neck	**47,1 (23,4-70,8)**	**41,7 (13,8-69,6)**	**44,8 (36,7-66,9)**
Head/face	41,1 (17,7-64,5)	41,7 (13,8-69,6)	41,4 (23,5-59,3)
Neck/cervical spine	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Upper limb	**23,5 (3,3-43,7)**	**25,0 (0,5-49,5)**	**24,1 (8,5-39,7)**
Shoulder/clavicle	17,6 (0,0-35,5)	16,7 (0,0-37,8)	17,2 (3,5-30,9)
Upper arm	-	-	-
Elbow	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Forearm	-	-	-
Wrist/hand/fingers	-	8,3 (0,0-23,9)	3,4 (0,0-10,0)
Trunk	**5,9 (0,0-17,1)**	**8,3 (0,0-23,9)**	**6,9 (0,0-16,1)**
Ribs/upper back	5,9 (0,0-17,1)	8,3 (0,0-23,9)	6,9 (0,0-16,1)
Abdomen	-	-	-
Low back	-	-	-
Sacrum/pelvis	-	-	-
Lower limb	**23,5 (3,3-43,7)**	**25,0 (0,5-49,5)**	**24,1 (8,5-39,7)**
Hip/groin	-	-	-
Thigh, anterior	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Thigh, posterior	11,8 (0,0-27,1)	8,3 (0,0-23,9)	10,3 (0,0-21,4)
Knee	-	8,3 (0,0-23,9)	3,4 (0,0-10,0)
Lower leg	-	8,3 (0,0-23,9)	3,4 (0,0-10,0)
Ankle	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Foot/toe	-	-	-

4.2.5. Injury type

Table 6 summarises the proportion of match injuries by injury type for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The most common injury types were central/peripheral nervous system injuries with 37,9%, followed by the muscle/tendon (31,0%) and joint/ligament (17,2%). The most common specific injury types

sustained by backs were concussion (35,3%), muscle strain/cramp (23,6%) and fracture (11,8%). Concussion (41,7%) and muscle strain/cramp (33,3%) were the most common specific injuries presented by the forwards.

Table 6. Proportion of match injuries by injury type			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
Bone	**11,8 (0,0-27,1)**	**8,3 (0,0-23,9)**	**10,3 (0,0-21,4)**
Fracture	11,8 (0,0-27,1)	8,3 (0,0-23,9)	10,3 (0,0-21,4)
Other bone injury	-	-	-
C/PNS	**35,3 (12,6-58,0)**	**41,7 (13,8-69,6)**	**37,9 (20,2-55,6)**
Concussion	35,3 (12,6-58,0)	41,7 (13,8-69,6)	37,9 (20,2-55,6)
Nerve injuries	-	-	-
Joint (non-bone) / ligament	**17,6 (0,0-35,7)**	**16,7 (0,0-37,8)**	**17,2 (3,5-30,9)**
Dislocation / subluxation	5,9 (0,0-17,1)	8,3 (0,0-23,9)	6,9 (0,0-16,1)
Meniscus / Disc Injury	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Sprain/ligament	5,9 (0,0-17,1)	8,3 (0,0-23,9)	6,9 (0,0-16,1)
Other	-	-	-
Muscle / tendon	**29,4 (7,7-51,1)**	**33,3 (6,6-60,0)**	**31,0 (14,2-47,8)**
Haematoma/bruise	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Muscle strain/cramp	23,6 (3,4-43,8)	33,3 (6,6-60,0)	27,6 (11,3-43,9)
Tendon injury/tendinopathy	-	-	-
Other	-	-	-
Skin	**5,9 (0,0-17,1)**	**-**	**3,4 (0,0-10,0)**
Abrasion	-	-	-
Laceration	5,9 (0,0-17,1)	-	3,4 (0,0-10,0)
Other types	**-**	**-**	**-**
Visceral	-	-	-
Other	-	-	-

C/PNS: Central and Peripheral Nervous System

4.2.6. Most common and highest risk injuries

Table 7 identifies the most common match injuries by injury diagnosis for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The most common injury was concussion (all players: 37,9%; backs: 35,3%; forwards: 41,7%).

Table 7. The four most common injury diagnoses reported for backs, forwards and all players (% of all reported match injuries)					
Backs		Forwards		All players	
Injury	%	Injury	%	Injury	%
Concussion	35,3	Concussion	41,7	Concussion	37,9
Hamstring strain	11,8	Shoulder pain	16,7	Shoulder Pain	10,3
AC joint sprain	5,9	Hamstring strain	8,3	Hamstring strain	10,3
Shoulder Pain	5,9	Lower leg muscle Inj.	8,3	Ribs fracture	6,9

Table 8 summarises the injuries with greatest burden for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The injuries with the greatest burden across all players were hamstring strain (19,3%) and concussion (15,9%). For backs, hamstring strain (21,4%) and shoulder chondral lesion (15,0%) were responsible for the greatest time loss while concussion (21,4%) and shoulder pain (17,5%) caused the greatest burden for forwards.

Table 8. The four injury diagnoses with greatest burden reported for backs, forwards and all players (% of all reported days lost to match injuries)					
Backs		Forwards		All players	
Injury	%	Injury	%	Injury	%
Hamstring strain	21,4	Concussion	21,4	Hamstring strain	19,3
Shoulder chondral lesion	15,0	Shoulder pain	17,5	Concussion	15,9
Humerus fracture	14,9	Hamstring strain	16,0	Shoulder Pain	15,0
Concussion	14,7	Lower leg muscle Inj.	14,2	Humerus fracture	9,0

4.2.7. Injury onset

Table 9 summarises the proportion of match injuries by nature of onset data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

Acute injuries were the only nature of injuries.

Table 9. Proportion of reported match injuries by nature of onset			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
Acute	100,0	100,0	100,0
Gradual	-	-	-

4.2.8. Cause of injury onset

Table 10 summarises the proportion of match injuries by cause of onset data for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

Contact mechanism represented 75,9% of all injuries while non-contact was 24,1%. Contact injuries were slightly more common for backs (76,5%) than for forwards (75,0%) but the difference was not significant.

Table 10. Proportion of reported match injuries by cause of onset			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
Contact	76,5 (56,3-96,7)	75,0 (50,5-99,5)	75,9 (60,3-91,5)
Non-contact	23,5 (3,3-43,7)	25,0 (0,5-49,5)	24,1 (8,5-39,7)

4.2.9. Match events leading to injury

Table 11 summarises the match events causing the injuries suffered by players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The most common match event leading to injury was being tackled (24,1%), followed by running and tackling (20,7% each), ruck and collision (13,8% each) and other/not known (6,9%). For backs, the most common match events leading to injury were being tackled (35,3%) and running (23,5%), followed by tackling (17,6% each). For forwards, the most common match events leading to injury were tackling (25,0%), followed by collision, ruck, running and other/not known (16,7% each).

Table 11. Proportion of reported match injuries by match event leading to injury			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
Collision	11,8 (0,0-27,1)	16,7 (0,0-37,8)	13,8 (1,2-26,4)
Kicking	-	-	-
Lineout	-	-	-
Maul	-	-	-
Ruck	11,8 (0,0-27,1)	16,7 (0,0-37,8)	13,8 (1,2-26,4)
Running	23,5 (3,3-43,7)	16,7 (0,0-37,8)	20,7 (6,0-35,4)
Scrum	-	-	-
Tackled	35,3 (12,6-58,0)	8,3 (0,0-23,9)	24,1 (8,5-39,7)
Tackling	17,6 (0,0-35,7)	25,0 (0,5-49,5)	20,7 (6,0-35,4)
Other/Not known	-	16,7 (0,0-37,8)	6,9 (0,0-16,1)

4.2.10. Time of injury

Table 12 summarises the proportion of reported match injuries by period of match for players, categorised as backs, forwards and all players, taking part in Men´s 7s REC 2024.

The highest number of match injuries sustained by all players happened during the first half (58,6%).

Table 12. Proportion of reported match injuries by time during match			
Measure	% (95% Confidence interval)		
	Backs	Forwards	All players
First half	64,7 (42,0-87,4)	50,0 (21,7-78,3)	58,6 (40,7-76,5)
Second half	35,3 (12,6-58,0)	50,0 (21,7-78,3)	41,4 (23,5-59,3)

5. ACKNOWLEDGEMENTS

World Rugby and Rugby Europe would like to thank all competition organisers and participants for kindly sharing their data for this report.

The authors acknowledge the valuable support provided by 8 team physicians and physiotherapists during the collection of the data analysed in this report. The authors would therefore like to apologise if anyone who provided data for the study has accidently been missed from the list of acknowledgements below (presented alphabetically):

Arnaud Liebert, Björn Bürgler, Dominik Draženović, Emilo Garcia, Giorgi Gvazava, Jean-Loup Hadjadj, José Carlos Conceição Rodrigues, Olena Zadorozhna, Orla Armstrong, Pete Hall, Tautdvydas Melys and Tommaso Rocco Silvio Cattaneo.

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