

Injury surveillance in a rugby tournament

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Abstract

Objective—To investigate injuries in international rugby football.

Methods—All injuries that led to temporary stoppage of the game or to the substitution of a player during the Rugby World Cup prequalifying tournament were recorded. Six matches were played, involving the Arabian Gulf, Kenya, Namibia, and Zimbabwe.

Results—47 injuries were recorded, giving an injury rate of eight per match. The number of injuries decreased from 38.3% in the first matches to 23.4% in the final ones. The most serious injury was a concussion and the majority of the injuries affected soft tissues. Anatomically, the lower limbs suffered most injuries (46.8%), followed by the head (21.3%), trunk (17.0%), and upper limbs (12.8%). Slightly more injuries occurred in the defensive half of the field of play (53.2%) than in the offensive half (46.8%). More injuries occurred in the second half (61.7%) than in the first half (38.3%).

Conclusions—Protective equipment should be introduced to minimise the number and seriousness of injuries in rugby.

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Key terms: injuries; rugby football.

Injuries are inevitable in contact sports, rugby being no exception.^{1,2} In fact rugby is considered to be one of the dangerous sports.³ Specific situations of the game such as the "set scrum", the "rucks", or the "maul" lead to heavy bodily contact and increase the risks of injury.^{2,4,5} Nevertheless, acts of violence could be minimised by strict enforcement of Law 20, which relates to charging, obstruction, foul play, and misconduct.^{5,6}

The injury registration in rugby helps to detect new patterns of injury resulting from changes in style of play, and is of value in identifying means of treatment and rehabilitation,⁷ as indeed it does in other forms of sport.^{8,9} Many researchers have analysed the occurrence of rugby injuries both in training and competition, classifying them in relation

to anatomical categorisation,^{4,10} position of play,^{4,11-13} and time of injury in a game.¹⁰ The results from these studies are quite variable. No specific pattern of rugby injuries has so far been established.

It is upon this foundation that the present study assessed the nature, anatomical distribution, frequency, timing, and possible causes of injuries that occurred during the Rugby Football World Cup prequalifying matches held in Nairobi, Kenya (July 3-10, 1993).

Methods

Kenya hosted the Rugby World Cup prequalifying tournament involving the Arabian Gulf, Namibia, Zimbabwe, and Kenya herself. Each of the participating teams played each other during the tournament. A total of six matches was played during days with temperatures varying between 21 and 25°C and relative humidity of 40-49%. The pitch conditions were generally dry.

Data were collected by observers with previous experience in the game of field hockey⁹ and volleyball.⁸ The injuries recorded were those that received medical attention with the consent of the match referee. The observers positioned themselves close enough to the touch line for a clear view of the games. Each team played three matches. The results are presented in terms of the first, second, and third matches.

The variables recorded included: type, frequency, and anatomical site of an injury; the part of the field in which it occurred; and the time course of the injury. The diagnosis was confirmed at the end of each game by talking to both the affected player and the head of the medical team. The data were collected using an injury analysis observation sheet and analysed descriptively.

Results

Forty seven injuries were recorded. This represents an average of about eight injuries per game.

Table 1 shows the distribution of injuries per country per match. In general, the number of injuries decreased from 18 (38.3%) in the first matches to 16 (34.9%) in the second, and finally to 11 (23.4%) in the last matches. The only country to which this trend did not appear to apply was Namibia, the eventual winners.

Another interesting observation is that the Arabian Gulf, the losers in this tournament, registered the highest number of injuries (36.2%), followed by Namibia (29.8%). There is, however, no clear pattern relating the frequency of injuries to the final standing in the tournament.

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Table 1 Distribution of injuries per country per match during the Rugby World Cup prequalifying tournament held in Nairobi (July 3rd-10th, 1993)

Country	No of injuries				Position in tournament
	Match 1	Match 2	Match 3	Total (5)	
Arabian Gulf	8	6	3	17 (36.17)	4
Kenya (Hosts)	4	0	3	7 (14.89)	3
Namibia	2	7	5	14 (29.79)	1
Zimbabwe	4	3	2	9 (19.15)	2
Total	18 (38.3%)	16 (34.04%)	11 (23.4%)	47 (100)	

Table 2 Type of injury per match during the Rugby World Cup prequalifying tournament held in Nairobi (July 3rd–10th, 1993)

Type of injury	Match			Total (%)
	1	2	3	
Abrasion	–	–	1	1 (2.13%)
Concussion	1	–	–	1 (2.13%)
Contusion	13	10	9	32 (68.09%)
Dislocation	–	1	–	1 (2.13%)
Laceration	3	1	2	6 (12.77%)
Nose bleeding	1	–	–	1 (2.13%)
Sprain	–	4	1	5 (10.64%)
Total	18	16	13	47 (100.02%)*

*Rounding off error.

The types of injuries per match are shown in table 2. The majority of the injuries were contusions (68.1%), followed by lacerations (12.8%) and sprains (10.6%).

Table 3 shows the anatomical distribution of the injuries. The lower limbs registered the highest number of injuries (46.8%) followed by the head (21.3%), the trunk (17.3%), the upper limbs (12.8%), and finally the neck (2.1%). The thighs alone accounted for 21.3% of all the injuries; 83.0% affected the muscles, whereas 10.6% affected the ligaments.

Of the 47 injuries registered, 25 (53.19%) occurred in the defensive part of the field, whereas the remaining 22 (46.81%) were in the offensive half.

The time course of the injuries shows that only 18 (38.3%) of the injuries occurred during the first half as opposed to 29 (61.7%) in the second half (see the figure). This reflects an increase of 61.1% during the second half. The majority of the injuries occurred between the 61st and the 70th minute (25.5%), while the least (6.4%) occurred during the 11th to the 20th minute. Compared to the same period in the first half (21st to 30th minute), the number of injuries during the 61st to 70th minute reflected a 200% increase.

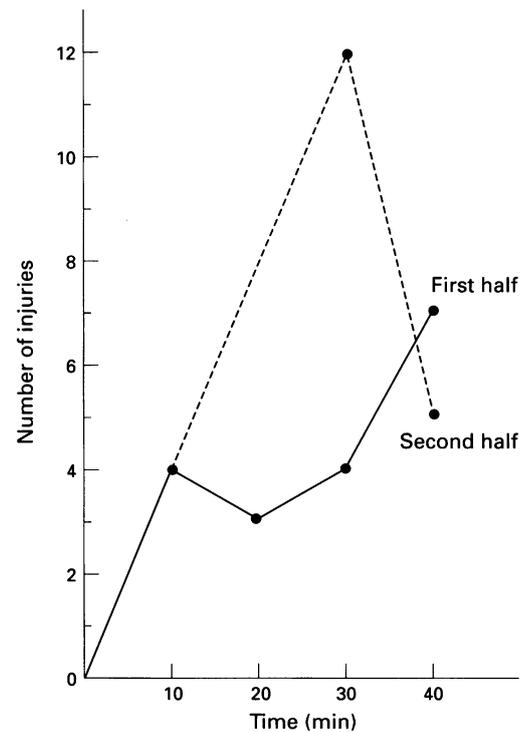
Discussion

Most of the studies which have been done to establish the risk probability level for

Table 3 Anatomical distribution of injuries during the Rugby World Cup prequalifying tournament held in Nairobi (July 3rd–10th, 1993)

Body part	No	Percent of total
Head		
Forehead	4	8.5
Brain	1	2.1
Nose	1	2.1
Mouth	1	2.1
Eye	2	4.3
Ear	1	2.1
Neck	1	2.1
Upper limb		
Shoulder	2	4.3
Arm	1	2.1
Wrist joint	2	4.3
Fingers	1	2.1
Trunk		
Back	1	2.1
Chest	3	6.4
Abdomen	1	2.1
Waist	1	2.1
Ribs	2	4.3
Lower limb		
Groin	1	2.1
Thigh	10	21.3
Knee	4	8.5
Shin	4	8.5
Ankle	3	6.4
Total	47	99.9*

*Rounding off error.



Time course of injuries during the Rugby World Cup prequalifying tournament held in Nairobi, Kenya (July 3rd–10th, 1993).

rugby were based on medical records.^{6 11 13–15} Although this approach tends to ignore some minor injuries where treatment is not sought,¹⁰ its modification as used in this study proved useful and convenient. The design of this study differs from all previous ones in rugby as it was prospective rather than retrospective. Therefore, the results obtained are not exactly comparable with those of other studies.

In the tournament under review, the majority of the injuries affected the muscles and the ligaments. This observation is in agreement with other findings in rugby^{4 5} as well as in hockey,⁹ and soccer.¹⁶

We noted an average injury rate per game of about eight. This finding compares well with the average of nine by Reilly and Hardiker.¹⁰

Our observation that the number of injuries decreased as the tournament progressed is difficult to explain on the basis of the data from this study. The number of players remained constant as they had already been registered. We think that the motivation to win must have decreased over time, hence accounting for this trend. However, this needs further investigation.

Most of the injuries in this tournament affected soft tissues. The most serious injury was a concussion. We did not register very serious injuries such as have been recorded elsewhere, for example, fractures⁵ and spinal injuries.⁶

If the field of play is divided into defensive and offensive parts separated by the centre line, then more injuries occurred in the defensive half of the field (53.2%), although the difference was minimal.

In a study done in Great Britain, more injuries were reported in the second half of the

game (55.3%) than in the first half (44.7%),¹⁰ while a significantly higher frequency was reported in the third quarter of the game (32.4%). Our study was similar, with 38.3% of the injuries in the first half and 61.7% in the second. From these two studies, most of the rugby injuries appear to occur between the 50th and the 70th minute. Although the "habitual match routine" has been blamed for this by Reilly and Hardiker,¹⁰ we suspect fatigue. Fatigue affects the concentration, technique and general coordination.¹⁷ However, more detailed physiological study of the players within this period would shed more light on this problem and open the way for a preventive approach.

In terms of the anatomical site of injury, previous research findings indicate that the head and face are the frequently injured parts of the body, followed by the lower leg and shoulder.^{10 13 14} Our study showed that the head (21.3%), the upper leg (23.4%), and the lower leg (23.4%) were affected in near equal proportions. Moreover, the lower limbs (46.8%) suffered more injuries than the head, neck, and upper limbs combined (36.2%). This is also true for handball,¹⁸ hockey,⁹ and soccer.¹⁶

From our findings and those of previous studies, we believe that it is high time that protective equipment – such as a helmet, face mask, and shoulder pad – was introduced to minimise both the number and severity of injuries in the game of rugby.

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