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A prospective study of the incidence and nature of injuries to adult rugby players

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Summary

The incidence and nature of injuries occurring in 8 adult club rugby teams was followed prospectively during the 1988 rugby season. The findings were compared with those from two similar studies in schoolboy rugby players.

A total of 114 injuries were sustained by 78 players; 85% of injuries occurred during matches. Injury was most prevalent during the first 8 weeks of the season and again after the mid-season break. Hookers (19%), wings (15%), fullbacks (11%) and centres (10%) were the players most often injured. Injury occurred most commonly when the player was tackled (26%), during open play (21%) and during the loose scrum (17%). Muscles (33%) and ligaments (32%) were the anatomical structures most often injured. Injury caused 35% of injured players to miss more than 35 days of rugby. Thirteen per cent of injured players did not play again for the rest of the season and only 14% of injured players returned to rugby after 7 days or less. Prolonged disability was associated with ligament injuries (57%), dislocations (17%) and fractures (10%).

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There are few prospective studies of injuries occurring in rugby players. Two such previous studies have described the incidence and nature of schoolboy rugby injuries,^{1,2} but there are no similar studies in adults. Since the incidence of injury increases with the age and skill of the schoolboy players,^{1,2} it is likely that the older, more skilled adult rugby players are at greater risk of injury than schoolboys. It is also possible that the aetiology and nature of injuries in adult players may differ.

To study these possibilities, we completed a prospective study of the injuries that occurred in 8 first-division club rugby teams during the 1988 season. We particularly wished to determine whether conclusions drawn from studies of schoolboy rugby injuries applied to injuries incurred by adult players.

Subjects and methods

Eight first-division senior rugby teams from clubs in the Cape Peninsula were selected for the study and before the rugby season began a contact person from each club was fully informed of the aims and methods of the study.

During the season, data were collected with the same questionnaire used in the previous studies.^{1,2} Players whose injuries complied with our definition completed the questionnaire, which elicited information under the following headings: per-

sonal data, injury data, specific diagnosis, and medical treatment.

Personal data included the age, mass, height, club and playing position of the injured player. The injury data and specific diagnosis sections determined the following: (i) mechanism of injury; (ii) type of injury; (iii) anatomical site of injury; (iv) specific injury diagnosis; (v) number of days unable to play rugby as a result of the injury; (vi) match v. practice; and (vii) the time of the season when the injury occurred. The medical treatment section established the number of injured players who required medication, physiotherapy or surgery or a combination of one or more of these treatment modalities.

Questionnaires were handed to the injured players and collected by the contact person at each club on a weekly basis. We collected the completed questionnaires regularly throughout the season.

Definition of an injury

The definition of an injury was adapted from the previous studies^{1,2} and was as follows: an injury that prevented a man from playing rugby for 7 or more days or that required medical or surgical treatment. Thus, for example, lacerations requiring stitches had to be reported. As before, all cases of concussion had to be reported regardless of the length of time the man was unable to play rugby.

Analysis of survey forms

The data from the questionnaire were analysed, as previously described,^{1,2} according to the following categories: (i) overall number and incidence of injuries; (ii) playing position and type of injury; (iii) site and nature of injury; (iv) mechanism of injury; (v) duration unable to play rugby as a result of the injury; (vi) incidence of injuries in matches and practices; (vii) specific diagnosis; and (viii) medical treatment. The collected data were compared with those previously collected² to determine whether trends in club rugby injuries were similar to those identified in schoolboy players.

Results and discussion

Number and incidence of injury

Seventy-eight players suffered a total of 114 injuries during the season. If the same 15 players had played in each of the 8 teams for the full season, each player would have had a 95% likelihood of suffering an injury.

Ninety-seven injuries (85%) occurred in matches and 17 (15%) during practices. The majority of the match injuries (88%) occurred during league fixtures as opposed to friendlies (6%) and other matches (12%). Fifty-eight per cent of practice injuries occurred during match practice, 33% during skill training and 8% during physical training. In comparison, schoolboys were found to suffer a smaller percentage of injuries in matches (71%) and more in practices (29%).²

The overall incidence of injury was 1/171 playing hours of rugby, with 1 injury occurring every 60 playing hours of

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match play and 1 injury every 780 playing hours of practice. As shown in Fig. 1, the incidence of injuries during matches and the overall injury incidence are higher in adult players than in schoolboys.^{1,2} The incidence of injuries during practice was also higher in the adult players with one exception (1982 high school study).¹

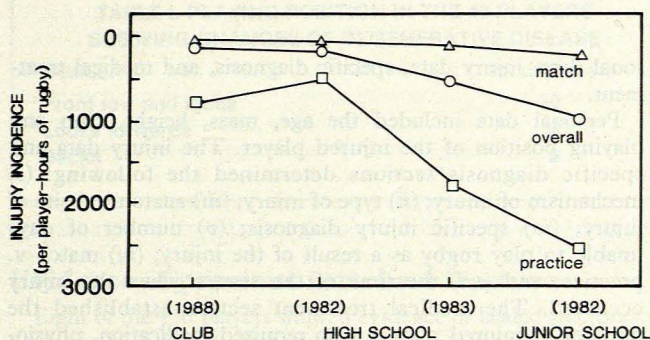


Fig. 1. Injury incidence during practices, matches and overall, for junior school, high school and adult (club) rugby players. Data for junior and high school players are from two previous studies.^{1,2}

Durkin³ reported essentially the same injury incidence (1 injury per 54 man-hours of match play) in adult first league rugby players in Britain between 1972 and 1976. The definition of injury used by Durkin³ was the same as ours; this finding might suggest little change in injury incidence over the past decade.

Incidence of injury at different times of the season

The incidence of injury was highest (45%) during the first 8 weeks of league fixtures which began in April (Fig. 2). Few matches, all friendlies, were played in March and more time was spent practising during that month. This would explain the low incidence (5%) of injury reported in March. The incidence of injury rose again in August following a break in league fixtures in July.

This pattern is the same as that identified in schoolboy rugby players.^{1,2}

The incidence of injury in different playing positions

The most commonly injured players were the hookers (19%) followed by the wings (15%) and the fullbacks (11%) (Fig. 3). Props (6%), locks (6%) and scrumhalves (5%) were the least injured players.

Fig. 3 compares the incidence of injury in the different playing positions for the adult players in this study with the schoolboy players from our previous study.² It shows that the positions that are at high risk in schoolboy players (wing, fullback, centre) are also at high risk in adult rugby. Discrepancies were noted for hookers (more injuries in adult players) and for eighth men, flyhalves and scrumhalves (more injuries in schoolboys).

Two previous studies of adult players also found that hookers, fullbacks and eighth men were the players most prone to injury.^{3,4}

The finding that hookers were the most prone to injury in this study deserves further comment. In our first study of schoolboy players,¹ we found that 32% of injuries occurred to hookers and that most of such injuries occurred in the set scrum. On the basis of this finding, we proposed that schoolboy

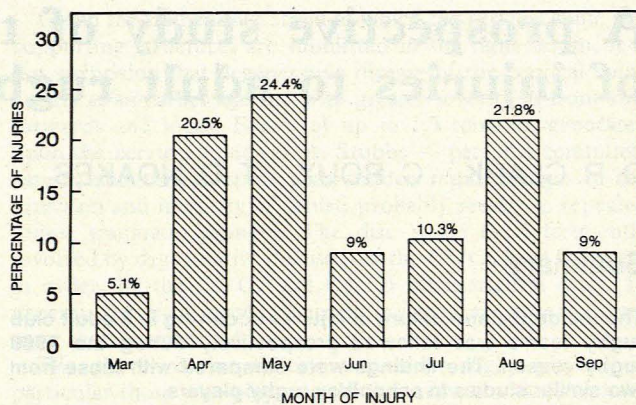


Fig. 2. The percentage of injuries occurring in the different months of the playing season.

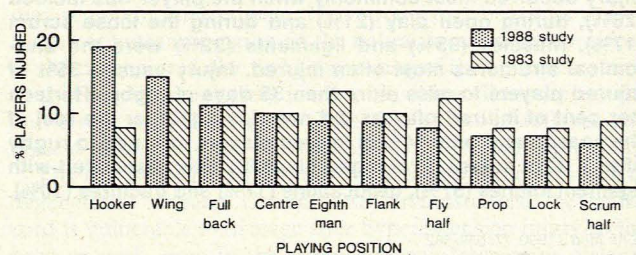


Fig. 3. Percentage of injuries sustained by players in the different playing positions; the 1983 study refers to schoolboy injuries,² the 1988 study is the present study.

hookers may not have sufficient neck strength to cope with the forces generated in the scrum. However, in our second, larger schoolboy study,² hookers were among the least injured players, suggesting that the earlier finding may have been spurious.

However, the finding of this study that injuries to hookers comprised 19% in adult players is cause for concern. The incidence is higher than values of 9%³ and 13%⁴ in previous studies of adult players. If, as was found in schoolboys,^{1,2} most adult hookers suffer scrum-related neck injuries, this suggests either that even adult players may not be sufficiently strong to resist the forces of the scrum or that the scrum, as presently constituted, may not be stable enough. In this context it should be noted that, contrary to a widely held belief, the majority of catastrophic neck injuries occur in adult players.⁵

Given the progressively increasing incidence of catastrophic neck injuries in South African rugby players, these possibilities need urgent attention.

The incidence of injury and phase of play

The greatest percentage of injuries occurred in players being tackled (26%) (Fig. 4). Open play (21%), the loose scrum (17%) and tackling (14%) were the next most frequent causes of injury. Foul play contributed less than 5% of injuries and the safest phase of play was the line-out (3%).

When compared with findings in schoolboy players, senior players were injured more frequently in open play and less frequently when they were tackling an opponent. The pattern of injuries in the other phases of play was otherwise remarkably similar (Fig. 4).

These findings suggest that adult players may be more competent tacklers than schoolboys and therefore less prone to injury when tackling an opponent. The reason for the higher incidence of injury during open play in adults is not clear.

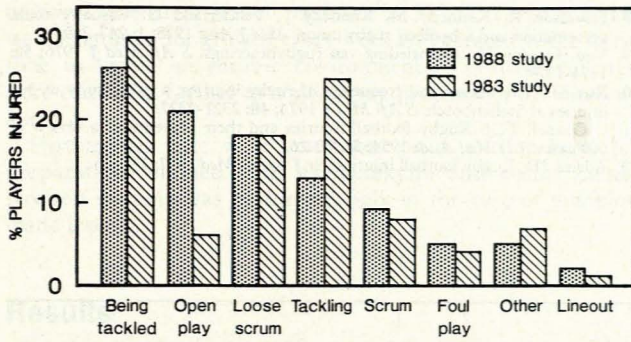


Fig. 4. Percentage of players injured in the different phases of play; the 1983 study refers to schoolboy injuries,² the 1988 study is the present study.

Type and anatomical site of injuries

Muscle (33%) and ligament (32%) injuries, and fractures (11%) were the most common injuries (Table I). Compared with schoolboys, muscle injuries were more, and fractures less, prevalent in adult players. Most studies have shown few differences in the relative frequency of the different types of injury between schoolboys and adults.^{3,4,6,7} The incidence of concussion was similar to that in the schoolboys; generally schoolboys are considered to be more prone to concussion than adults.^{1,2}

TABLE I. INCIDENCE OF THE DIFFERENT TYPES OF INJURY: COMPARISON BETWEEN ADULT AND SCHOOLBOY RUGBY PLAYERS

Type of injury	Incidence (%)	
	This study	1983 study ²
Muscle	33	17
Ligament	32	25
Fracture	11	27
Concussion	10	12
Dislocation	9	10
Bone bruising	4	6
Laceration	3	—
Internal	1	3
Tendon injuries	—	—
Ear haematomas	—	3

The anatomical sites of injuries were not greatly different between schoolboys and adults; in both groups, the lower limb was the most frequently injured site (Table II). The high prevalence of head and neck injuries in both adult and schoolboy rugby players is noticeable. Other studies of adult players

TABLE II. INCIDENCE OF INJURY AT DIFFERENT ANATOMICAL SITES: COMPARISON BETWEEN ADULT AND SCHOOLBOY RUGBY PLAYERS

Anatomical site	Injury incidence (%)	
	This study	1983 study ²
Lower limb	44	37
Upper limb	27	20
Head and neck	23	29
Trunk	7	13

have also reported a high prevalence of injuries to the lower limb and the neck.^{6,8-12} In both adults and schoolboys, the trunk is the least injured part of the body (Table II).

The large muscle groups that are involved in running and tackling were more prone to injury. Thus 22% of all muscle injuries occurred to the hamstrings, 16% to shoulder, 14% to thigh and 11% to the neck.

Ligament injuries occurred at four different anatomical sites; knee (39%), shoulder (33%), ankle (19%) and neck (8%).

Days absent from rugby

Of all injured players, 35% were absent from rugby for 35 days or more, while 13% did not play again that season (Fig. 5). Only 14% of injured players were able to return after 7 days or less. The majority of injuries that resulted in players missing 35 or more days were ligament injuries (57%), dislocations (17%) and fractures (10%).

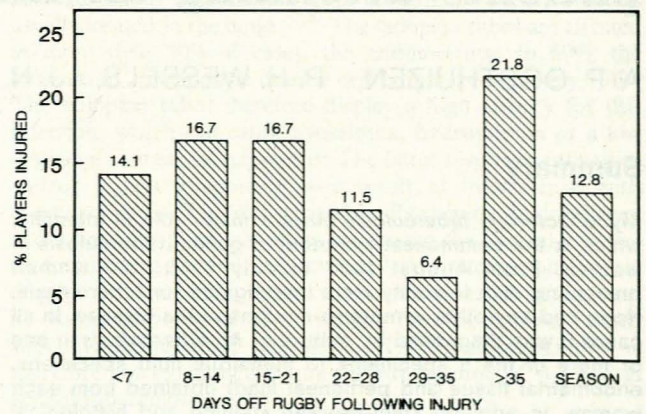


Fig. 5. Percentage of injured players who were unable to play rugby for varying periods after injury.

Conclusion

This study shows that while adult rugby players suffer injuries that are similar to those of schoolboy players in pathogenesis and in distribution both anatomically and according to playing position, there are nevertheless some important differences.

1. As might be expected, the incidence of injury is much higher in adult rugby players. Thus the likelihood that an individual adult player will sustain an injury during the season is of the order of 65%.
2. The severity of the injuries is greater, with 13% of injuries being sufficiently severe to prevent the player from participating again during that rugby season.
3. Adults suffer fewer injuries in practices than do schoolboys.
4. Contrary to popular opinion, adults playing in the position of hooker appear to be more susceptible to injury than schoolboys playing in this position.
5. Adult players are less likely to be injured when tackling another player than are schoolchildren.

REFERENCES

1. Nathan M, Goedeke R, Noakes TD. The incidence and nature of rugby injuries experienced at one school during the 1982 rugby season. *S Afr Med J* 1983; **64**: 132-137.
2. Roux C, Goedeke R, Visser GR, Van Zyl AW, Noakes TD. The epidemiology of schoolboy rugby injuries. *S Afr Med J* 1987; **71**: 307-313.
3. Durkin TE. A survey of injuries in a 1st-class rugby union club from 1972-1976. *Br J Sports Med* 1977; **11**: 7-11.

4. Northern Transvaal Rugby Union. *Rugbybeserings: 'n Studie van 'n Statistiese Opname*. Pretoria: NTRU, 1982.
5. Taylor TKF, Coolican MRJ. Spinal-cord injuries in Australian footballers, 1960 - 1985. *Med J Aust* 1987; **147**: 112-118.
6. Weightman D, Browne RC. Injuries in association and rugby football. *Br J Sports Med* 1974; **8**: 183-187.
7. Davies JE, Gibson T. Injuries in rugby union football. *Br Med J* 1978; **2**: 1759-1761.
8. Davidson R, Kennedy M, Kennedy J, Vanderfield G. Casualty room presentation and schoolboy rugby union. *Med J Aust* 1978; **1**: 247-249.
9. Van Heerden JJ. 'n Ontleding van rugbybeserings. *S Afr Med J* 1976; **50**: 1374-1379.
10. Roy SP. The nature and frequency of rugby injuries: a pilot study of 300 injuries at Stellenbosch. *S Afr Med J* 1974; **48**: 2321-2327.
11. O'Connell TCJ. Rugby football injuries and their prevention: a review of 600 cases. *J Ir Med Assoc* 1954; **34**: 20-26.
12. Adams ID. Rugby football injuries. *Br J Sports Med* 1977; **11**: 4-6.