Surveillance of injuries among Kenya Rugby Union (KRU) players — Season 2010

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Abstract

Objective: To determine the incidence and characteristics of injury amongst Kenya rugby union players and associated factors.

Design: A whole population prospective cohort study.

Methods: 364 registered Kenya rugby union (KRU) players were studied throughout the 2010 season. Data on their demographics, injury incidence, pattern and severity were gathered. The study tool used was the Rugby International Consensus Group (RICG) Statement.

Results: There were 173 backs and 191 forwards. One hundred and two 1 injuries for 60 league games (2400match player hours) were recorded. The incidence of injuries was 42.5/1000 match player hours (mph), (44.2 for forwards and 40.8 for backs). Lower limb injuries were the most common (41.2%). Players were most prone to injuries in the in tackle scenario (63.7%), at the beginning of the season (47.1%), and in the last quarter (50%) of a game.

Conclusion: The injury incidence recorded contrast the earlier Kenyan data but is comparable to international amateur level incidence, uniqueness of the Kenyan environment notwithstanding. The higher rates associated with the tackle/tackled scenario, earlier part of the season and later part of the game, suggest interventions can target player conditioning, and use of protective gear.

Introduction

Rugby is a high velocity and collision sport attended by one of the highest rates of injuries in team sports (1-3). As is the trend in the global scene, rugby is increasingly a popular sport in Kenya. Competition is higher, the game faster and the players stronger. The combination of factors is fodder for rising rates of injury (1-7) with significant impact on player and team performance.

A 'prevention is better than cure' approach to rugby injury is made possible by understanding the characteristics and magnitude of the problem. An earlier Kenyan study suggested comparatively higher rates of rugby related injuries but did not establish models of relationships with risk factors (8). Internal and external factors shown to influence the outcome of injury include player fitness, part of the season, phase of play, player position, state of the pitch and player physique (9-14). According to Brooks for example, injuries that cause the most significant absence from the field of play for forwards and backs are anterior cruciate ligament and hamstring injury respectively (6).

This paper explores the injury experience and the associated risk profile during the Kenya 2010 15-side rugby season.

Methodology

The prospective whole population cohort study of 364 players was conducted in the 2010 15-aside season. It comprised of the Kenya cup (KC) division one and Eric Shirley shield (ESS) division two leagues. All players were KRU registered and had to be above 18years of age. The clinical officers in charge of data collection were trained for two weeks to use the instrument of data collection followed by a proficiency exam using preseason matches.

Blood bin injuries defined by Law 3.11(a) of International Rugby Board (IRB) were excluded unless a training session or match was subsequently missed because of the said injury.

Age, height, weight, injury status at that time and position played were documented preseason.

The players were clustered into forwards (positions 1 to 8) and backs (positions 9 to 15).

Data analysis was performed using SPSS version 17 software. Incidence was calculated as injuries per 1000 match player hours (mph) (95% CI). Student t-test was used to compare the means between injured and non-injured for continuous vari- ables i.e. age, weight, height, BMI.

Match exposure was calculated on the basis of 15 players (8 forwards, 7 backs) per team exposed for 80 minutes (first half 0-20, 20-40, second half 40-60, 60-80min

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Table 1: Comparison of anthropometric measures between KC and ESS players

Characteristic	KC(n=169)	ESS (n=195)	
	Mean(SD)	Mean(SD)	95% CI
Age	21.41 (3.07)	24.40 (3.78)	-3.69 to -2.28
Weight	78.29 (12.25)	85.91 (11.70)	-10.10 to -5.13
Height	1.74 (0.072)	1.77 (0.07)	-0.04 to -0.01
BMI	25.76 (3.78)	27.54 (3.44)	-2.53 to -1.03

Table 2: Comparative anthropometry between injured and non-injured players

Characteristics	Non-injured(n= 92)		
Mean(SD)	Injured (n=273)		
Mean (SD)	95% CI		
Age	22.57(3.77)	23.47 (3.52)	-1.78 to -0.02
Weight	80.89 (13.06)	84.62 (10.60)	-0.041 to -0.01
Height	1.74 (0.07)	1.77 (0.06)	-6.70 to -0.77
BMI	26.46 (3.87)	26.96 (3.26)	-1.38 to -0.39

Table 3: Incidence of injury as a function of location of body

Site	Backs			Forward			Total	
	Count	%	95%CI	Count	%	95%CI		%
Head face	11	10.78	4.7 to 16.8	12	11.8	5.5 to 18	23	22.5
Neck Cervical Spine	0	0	0	4	3.9	0.1 to 7.7	4	3.9
Sternum Ribs	0	0	0	3	2.9	-0.4 to 6.2	3	2.9
Upper Back								
Abdomen	0	0	0	1	1.0	-0.9 to 2.9	1	1
Lower back	1	0.98	-0.9 to 2.9	3	2.9	-0.4 to 6.2	4	3.9
Shoulder Clavicle	11	10.78	4.7 to 16.8	7	6.9	1.9 to 11.8	18	17.6
Upper Arm	1	0.98	-0.9 to 2.9	0	0	0	1	1
Elbow	0	0	0	1	1	-0.9 to 2.9	1	1
Forearm	0	0	0	2	2	-0.7 to 4.7	2	2
Wrist	0	0	0	1	1	-0.9 to 2.9	1	1
Hand Finger Thumb	1	0.98	-0.9 to 2.9	1	1	-0.9 to 2.9	2	2
Hip Groin	3	2.94	-0.4 to 6.2	1	1	-0.9 to 2.9	4	3.9
Posterior Thigh	2	1.96	-0.7 to 4.7	0	0	0	2	2
Knee	9	8.82	3.3 to 14.4	7	6.9	1.9 to 11.8	16	15.7
Ankle	10	9.8	4.0 to 15.6	6	5.9	1.3 to 10.5	16	15.7
Foot Toe	0	0	0	4	3.9	0.1 to 7.7	4	3.9
Total	49	48	38.3 to 57.8	53	52	42.2 to 61.7	102	100

utes). Approval for study was obtained from the Kenyatta National Hospital Ethics and Research Committee and the KRU board.

Results

Players enrolled in the study were 169 (76 backs and 93 forwards) for KC and 195 (97 backs 98 forwards) for ESS. The 30 KC and 30 ESS games played constituted a total 2400 mph. The season lasted

4 months during which 102 injuries were recorded. The incidence of injuries was 42.50/1000mph (Forwards 44.17; Backs 40.83).

The ages of the players ranged from 18 to 40 years with a mean of 22.80 years (SD 3.724). The mean weight was 81.83kg (SD12.57) with a mean height of 1.75metres (SD 0.70) and a mean BMI of 26.59(SD 3.73).

KC accounted for 64.6% of injuries which translated to an incidence of 55 injuries/1000mph and 30 injuries /1000mph for the ESS ($p<0.0001$). There was no career ending injury.

Anthropometry in relation to level of play

The Kenyan player's mean age was 22.80 years (SD 3.724) with a mean weight of 81.83kg (SD12.57) and mean height of 1.75(SD 0.70).

The KC player was older ($p <0.001$), heavier ($p <0.001$) and taller (p0.002) (Table 1).

Anthropometry between injured and non-injured

The 102 injuries occurred amongst 92 players. The injured player was older (p 0.046), heavier (p 0.014), taller (p 0.004), and with a larger BMI (p 0.271), (Table 2).

Distribution of injury based on location of body

The forwards had an injury incidence of 44.17injuries per 1000mph compared to 40.83 injuries per 1000mph for the backs (p 0.52). The most common regions injured were the lower limb (41.2%), upper limb (24.6%) and head and neck (26.4%).

The most common types of injuries were ligamentous (38.2%) and concussion (8.9%) (table4). The types of

Type	Backs	Forwards		Total				
	Count	%	95%CI	Count	%	95%CI	Count	%
Concussion	2	2	-0.7–4.7	5	4.9	0.7-9.1	7	6.9
Fracture	2	2	-0.7-4.7	3	2.9	-0.4-6.2	5	4.9
Dislocation	5	4.9	0.7-9.1	3	2.9	-0.4-6.2	8	7.8
Sprain Ligament Injury	21	20.6	12.7-28.5	18	17.6	10.2-25.1	39	38.2
Muscle Rupture								
Strain Tear Cramps	5	4.9	0.7-9.1	8	7.8	2.6-13.1	13	12.7
Tendon/bursa Injury	0	0	0	2	2	-0.7-4.7	2	2
Hematoma/ Contusion/								
Bruise	3	2.9	-0.4-6.2	2	2	-0.7-4.7	5	4.9
Abrasion	2	2	-0.7-4.7	0	0	0	2	2
Laceration	4	3.9	0.1-7.7	6	5.9	1.3-10.5	10	9.8
Visceral Injury	0	0	0	1	1	-0.9-2.9	1	1
Mixed	5	4.9	0.7-9.1	5	4.9	0.7-9.1	10	9.8
Total	49	48	38.3	53	52	42.2	102	100

Table 4: Types of rugby injuries

Table 5: Incidence of injury as a function of time

	Seasonal distribution		Game distribution	
Time	Frequency	Percentage	Frequency	Percentage
First Quarter	48	47.1	24	23.5
Second Quarter	23	22.5	9	8.8
Third Quarter	12	11.8	18	17.6
Fourth Quarter	19	18.6	51	50.0
Total	102	100.0	102	10

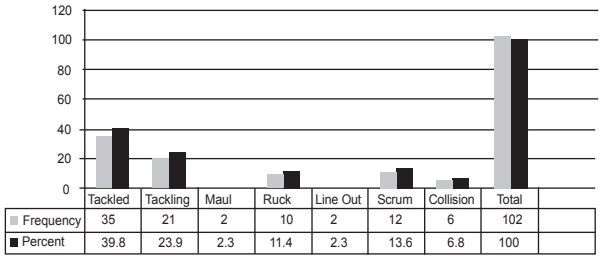

Figure 2: Association to trauma

injuries were generally of similar amongst the forwards and backs. (Table 3)

Distribution of injuries based on mechanism of injury

Majority of the injuries, 94.9% were a result of contact. The tackling/tackled scenario with a cumulative incidence of 63.7%, accounted for a majority of incidences in mechanism of injury. The line out and the maul accounted for the list incidence. (Figure 2)

Distribution of injury as a factor of time

The first quarter of the season had 47.1% of injuries, doubling any other quarter in the season. The frequency of injuries was highest in the first half of the season with a cumulative of 69.6%. (Table 5)

Most injuries occurred in the last quarter of the game, and a total 73.5% of injuries occurring in the extreme quarters of the game.

The proportion of injuries associated with foul play and dangerous play was 11.6% and 10.78% being linked with dangerous play.

A player in KC had higher overall risk to injury as compared ESS, odds ratio 2.18 (p 0.006).

Discussion

The purpose of this study was to report the incidence of injury and associated factors in amateur rugby in Kenya. Injury incidence was 42.50 injuries per 1000mph.

The Kenyan players were younger and lighter in weight when compared to players in professional leagues (9). This result is consistent with previous data that depict that bigger body sizes are associated with higher rates of injuries (9, 15). Compared to Kenya Cup (K), Eric Shirley Shield (ESS) players were smaller and younger. With a less stringent age of inclusion criteria; the differences may have been more dramatic.

Our overall injury incidence is consistent with armature level play. It is however one third that reported in the earlier Kenyan study (8). We contend that the discrepancy is occasioned by the exclusion of minor injuries

including blood bin injuries (8).

The tackle/tackling scenario was responsible for the highest injury incidence, as previously reported (7,9,16,17). In the present study however, most injuries afflicted the tackler contrasting recent trends. An entry point for prevention would be the acquisition of protective gear and coaching of skillful tackling techniques (9, 18).Most injuries occurred in the first quarter of the season. Similar results previously have ascribed this to preseason conditioning (12, 14). Coaches and fitness instructors invest time and resources in player fitness acquisition and early rehabilitation for the injured to mitigate against early season injuries (14).

Corroborating earlier studies (1,10,15), the results of the present study further show that approximately 50% of injuries occurred in the last quarter of the game, possibly due to fatigue, reduced self-awareness and protection (3,8,9). Therefore, improving player endurance and conditioning might aid.

The incidence and pattern of injuries was similar between forwards and backs and consistent with other reported data (9). The result on anatomical regions involved echoes previous reports (5, 9, 17). The head, shoulder and ankle were the most vulnerable to injury, probably related to exposure and involvement in most phases of contact. There are data to show that injuries occasioned by exposure and involvement of the head can be prevented by use of head gear (19, 20). Muscle strengthening exercises and use of shoulder pads can reduce shoulder injuries (20). Ankle injuries on the other hand are possibly exacerbated by poor pitch conditions, a relationship not explored in this study. Pre-match warming and conditioning would limit the ligamentous strains and muscle pulls which were common in these regions (1, 9).

The degree of foul play involvement was low (2). This was laudable and probably a pointer to the stringent measures by the IRB to counter foul play.

In conclusion, the study has provided benchmark values for the injury incidence and characteristics in Kenya. The injury rate recorded is much lower than previously documented.

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