# EPIDEMIOLOGY OF INJURIES AND DISEASES DUE TO OVERUSE IN RUGBY: OBSERVATIONAL STUDY OF THE PLAYERS OF "CUS PERUGIA RUGBY"

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## ABSTRACT

**Background** Rugby is a contact sport and for this reason is very demanding from a physical point of view. Up to now few studies describe the incidence and types of the most frequent traumas. The present study aims to evaluate the epidemiology of the major accidents related to the practice of this sport. **Materials and methods:** We collected data on a total of 321 players belonging to the Sports Club "CUS Rugby Perugia" for a total of three years taking into consideration the type of injury, the part of the body concerned, if the injury occurred during official competitions or in training, and also the lapse of time necessary for recovery. **Results:** We had a total of 240 accidents (45.8% of minor gravity, 36.6% of average gravity and 17.6% serious). About the type of trauma, we noticed that minor injuries consisted in most cases and above all in facial injuries, while the average and the severe severity accidents affected in most cases the knees: (sprains, meniscal and ligamentous tears). **Discussion:** By analyzing the collected data, we have noticed that the highest number of accidents occurred during official competitions, and especially during the last minutes of the game, probably due to a greater muscle fatigue. The role of the players is also important because it correlates with a different type of risk. **Conclusions:** This study confirms that rugby has a higher accident rate than other contact sports. Therefore specific training strategies and techniques should be implemented, reduce the incidence of injuries, especially at the level of the lower limbs.

**KEYWORDS:** Rugby, Injuries, Epidemiology, Contact Sport, Prevention

## Introduction

Rugby is a sport rapidly expanding in which players are often subject to trauma from high energy contact. Therefore this sport presents a greater risk of accidents than other sports, such as soccer or football [1]. Currently, few studies are analyzing the mechanisms of rugby-related trauma sand the prevention of them. The causes high rates of accidents are to be found both in a significant number of players, the lack of use of body protections, the critical axial loads faced by the players and the specific locations of the sport. In fact, the rugby players usually assume a posteriorly unbalanced posture, to remain stable in the early stages of contact, which results in greater difficulty controlling

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**Table 1** Type of injury and gravity.

| | MILD TRAUMAS | MODERATE TRAUMAS | SEVERE TRAUMAS |
|---|---|---|---|
| WOUNDS | 54 (34 faces, 10 hands, 4 thigh, 6 legs) | | |
| DEEP CONTUSIONS | 20 (8 thighs, 6 legs, 4 knees, 2 shoulders) | | |
| FINGER DISTORSION | 12 | | |
| CRANIAL TRAUMAS (MILD) | 14 | | |
| KNEE DISTORSIONS | 6 | | |
| SHOULDER DISTORTIONS | 4 | | |
| KNEE TRAUMAS | | 24 (4 post-traumatic patellar borsitis, 20 LCM lesions) | |
| FOOT/ANKLE | | 14 (4 plantar fasciitis, 2 tendinitis extensors of the ankle, 8 ankle distortions) | |
| THIGH MUSCULAR CONTUSIONS | | 14 | |
| HAND | | 10 (4 extensor tendon lesions, 6 interphalanx dislocations) | |
| SHOULDER | | 8 (4 Acromion-clavear dislocations, 4 subacromial impingement) | |
| FACE | | 8 (4 cheekbone fractures, 4 nasal bones fractures) | |
| NOT COMMOTIVE CRANIAL TRAUMAS | | 6 | |
| ANTERIOR CRUCIATE LIGAMENT LESIONS (with or without meniscal tear) | | | 8 |
| POSTERIOR CRUCIATE LIGAMENT LESIONS | | | 4 |
| PURE MENISCAL LESIONS | | | 4 |
| FINGERS FLEXORS TENDONS LESIONS | | | 4 |

| | MILD TRAUMAS | MODERATE TRAUMAS | SEVERE TRAUMAS |
|---|---|---|---|
| FINGER COMPLEX LESIONS | | | 6 |
| THIGH MUSCULAR LESIONS | | | 6 |
| ANKLE LIGAMENT LESIONS | | | 4 |
| CLAVICLE FRACTURES | | | 4 |
| CRANIAL COMMOTIVE TRAUMAS ASSOCIATED TO FACIAL BONES FRACTURES | | | 2 |

the stability of the foot and therefore a higher incidence of the trauma of the ankle and lower limb [2]. The control of static and dynamic balance requires complex proprioceptive, vestibular and visual interactions and consequently, in the tackle and the melee the players must support very high gravitational forces. The type of injury depends not only on the nature of the sport but also from the role of the player and hispcratice level [3]. The forwards have a higher risk of shoulder, knee and ankle injuries, while the backline players have a higher incidence of damage to the shoulder, the hamstrings and the knee [4].

An analysis of the most frequent diseases can set programs for prevention and specific treatment [5]. The objective of this study was to evaluate the epidemiology of major accidents related to rugby.

## Material and Methods

We conducted a longitudinal observational study on the team players of CUS Rugby Perugia, for a total of 321 players during the 2012-2013 and 2013-2014 seasons. The teams examined are eight, and specifically: first men's team (2012-2013 Series B, Series A 2013-2014), team "Old" (over 30), team U-20 team under 18, under 14 team, Under-12 team, the team of series C and women's team of Serie A. The parameters considered are:

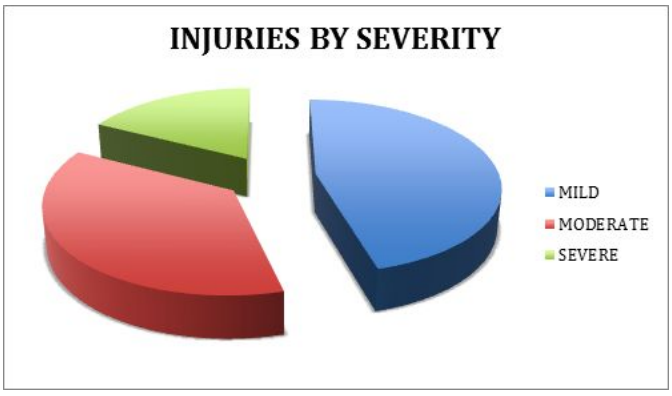



**Figure 1:** Injuries by trauma severity.

the body segment concerned, the type of injury, the category of the injured players, the period of the season when the injury happened, whether in training or during official competitions, recovery time and return to sports. About the type of injury we have divided the trauma into three degrees of severity depending on the duration of the prognosis: lower (prediction of fewer than 15 days), medium (16-30 days) and severe (over 30 days).

## Results

The total number of traumas was 240 cases, divided into 110 mild injuries (45.8%), 88 moderate injuries (36.6%) and 42 severe injuries (17.6%). (fig.1)

The body segment involved in the mild traumas was: face 34 cases (30.9%), hand 22 cases (20%), head 14 cases (12.7%), thigh 12 cases (10.9%), leg 12 cases (10.9%), knee 10 cases (9.1%) and shoulder 6 cases (5.5%); the injuries of moderate severity: knee 24 cases (27.3%), foot and ankle 14 cases (15.9%), thigh 14 cases (15.9%), hand 12 cases (13.6%), shoulder 10 cases (11.4%), face 8 cases (9.1%), head 6 cases (6.8%); in severe injuries: knee 20 cases (47.6%), hand 10 cases (23.8%), thigh 6 cases (14.3%), shoulder 4 cases (9.5%), head 2 cases (4.8%). Splitting the data by type of injury, mild trauma as consist of: 54 wounds (34 face, 10 hand, 4 thigh and 6 leg), 20 deep contusions (8 thigh, 6 leg, 4 knee, 2 shoulder), 12 finger distortions, 14 mild cranial traumas, 6 knee mild distortions and 4 shoulder distortions (fig 2); moderate injuries: 24 knee traumas (4 pre-patellar post-traumatic bursitis, 20 ACL lesions), 14 foot/ankle (4 plantar fasciitis, 2 foot extensors tendinitis and 8 ankle distortions); 14 thigh muscular contusions; 10 hand (4 extensor tendon injuries, 6 interphalangeal distortions), 8 shoulder (4 acromioclavicular dislocations, 4 subacromial impingement syndrome), 8 face (4 fractures of the cheekbone and 4 fractures of the nasal bones), 6 commotive head injuries (fig 3); in severe injuries: 8 ACL injuries (with or without meniscal tear), 4 PCL injuries, 4 meniscal injuries, 4 hand flexor tendon injuries, 6 fingers complex lesions, 6 deep muscular contusions, 4 ankle ligaments injuries, 4 clavicle fractures, 2 commotive head trauma associated with frontal bone fractures (Table 1). To classify the severity of cranial traumas we based on recovery time and we classified them like mild injury if recovery time was less than 15 days, moderate if the recovery time was within 16-30 days and severe cranial trauma if recovery time was longer than 30 days.

The classification of the injured players is : 58 players of B-A series (20 mild, 22 moderate, 16 severe) , 32-player team "Old" (14 mild, 12 moderate and 6 severe), 22 players under 20 ( 14 mild, 6 moderate, 2 severe), 20 players under 18 (14 mild, 4 moderate and 2 severe), 16 players under 14 (10 mild, 4 moderate and 2 severe), 14 players under 12 (10 mild, 4 moderate, 0 severe), 44 men's team of series C (16 mild, 20 moderate, 8 severe), 34 women's team players in Major League (14 mild, 14 moderate and 6 severe) (fig 2). The incidence of injuries according to the periods of the season was 16 accidents during the preparation (12 milds, four moderates); 72 traumas during training (28 mild, 34 moderate and ten severe); 156 injuries during games (76 milds,

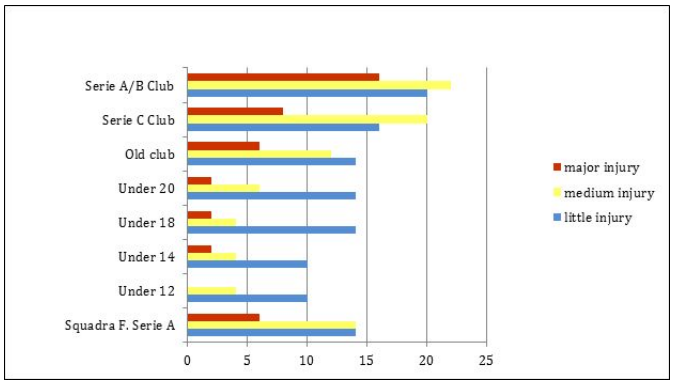



**Figure 2:** Injuries distribution per age.

50 moderates, 32 severe) (fig 3).

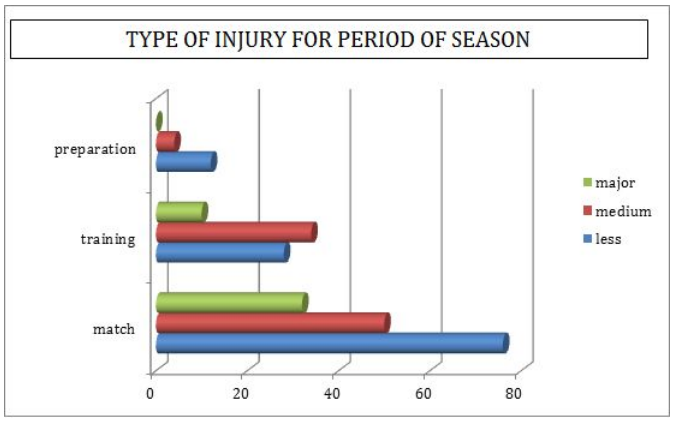



**Figure 3:** Injuries distribution during preparation, training and match.

## Discussion

This study gave us the opportunity to compare the nature and incidence of major injuries in sports rugby in a wide range of ages and different physical characteristics. The frequency of traumatic events was significantly greater during the match than during the phases of training in all categories examined. There was no significant difference in the type of major trauma in the various categories of players or a temporal variation in the different seasons of play. The highest number of injuries affected the lower extremity (46.6%) and specifically the knee (22.5%), slightly lower than reported by other studies (52-55%) [6-7]. Rates of injuries attractive ankle and shoulder are similar to reports in the literature. McGuine [8] indicates that previous ankle sprains predispose to a new injury due to an altered proprioception. Furthermore, the risk of harm also depends on the role of member "Scrum-Half" received the largest number of injuries (13.9%), followed by the "Number 8" (8.7%) which is the third player from the center line. In our study, we have seen that most of the injuries occurred as a result of a contact or a collision, 65% of the games and in a special way during the second half (58%). This is probably due to greater muscle fatigue associated with the advantage of playing time.

## Conclusion

The full categories of analysis and game situations examined in this study gave us the opportunity to compare the epidemiology of traumatic events in different sports conditions. The accident rate was not significantly different in the different categories. Although it is hard to change the intensity or playing conditions, it is important to consider the various locations of injury to design strategies for prevention and early treatment to reduce injuries from contact and other potentially risky sport-related behaviors.

## Aknowledgements

## Authors' Statements

*Competing Interests*

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding.

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