

# Investigation of traumatic orthopedic injuries in rugby players of Maranhão.

Investigação de lesões traumato-ortopédicas em jogadores de rugby do Maranhão.

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## Abstract

**Introduction:** Rugby is a sport that is growing in popularity worldwide. However, there are still a limited number of investigations on trauma-orthopedic injuries related to this sportive practice. **Objective:** To investigate traumatic orthopedic injuries in rugby players of Associação Maranhense de Rugby (AMARU) occurred in the first half of 2013. **Method:** 22 players were interviewed using a semi-structured questionnaire with 11 questions that addressed, among other issues, the ones related to the type and body region of injury, as well as the demographic of players. The design research meets the characteristics of a cross-sectional study of a descriptive nature. **Results:** Approximately 50% of rugby players of AMARU reported some trauma-orthopedic. These injuries are primarily associated with the training situation, especially the tackle. Injuries around the shoulder, knee and ankle are the most common. Muscle injury type distention was reported in 50% of players. Finally, in the opinion of the players, the condition of the pitch is the main extrinsic factor that causes injury. **Conclusion:** Information about trauma and orthopedic injuries of amateur athletes and encourage preventive and training measures for increasing the popularity of this sport grow in our country. From the findings of this study, AMARU can better guide their actions for favoring rugby practice in the state of Maranhão mainly from the perspective of health promotion and social inclusion.

**Keywords:** Athletic injuries; Athletes; Orthopedics.

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## Resumo

**Introdução:** O rugby é um esporte que cresce em popularidade no mundo todo. Porém ainda há um número limitado de investigações sobre as lesões traumato-ortopédicas decorrentes dessa prática. **Objetivo:** Investigar as lesões traumato-ortopédicas em jogadores de rugby da Associação Maranhense de Rugby (AMARU) ocorridas no primeiro semestre de 2013. **Método:** 22 jogadores foram entrevistados com o uso de questionário semi-estruturado com 11 questões que abordava dentre outras questões, aquelas relacionadas ao tipo e região corporal de acometimento da lesão, bem como dados sociodemográficos dos jogadores. O desenho da investigação atende as características de um estudo transversal de natureza descritiva. **Resultados:** Aproximadamente 50% dos jogadores de rugby da AMARU entrevistados relataram alguma lesão traumato-ortopédica. Essas lesões estão associadas principalmente a situação de treinamento, principalmente o *tackle*. Lesões nas regiões do ombro, joelho e tornozelo são as mais comuns. As lesões musculares do tipo distensão foi relatada em 50% dos jogadores. Por fim, na opinião dos entrevistados, as condições do gramado representam o principal fator extrínseco causador de lesão. **Conclusão:** Informações acerca das lesões traumato-ortopédicas de atletas amadores favorecem medidas preventivas e de treinamento para que cada vez mais a popularidade desse esporte aumente em nosso país. A partir dos achados deste estudo, a AMARU poderá melhor nortear suas ações para o favorecimento da prática do rugby no estado do Maranhão principalmente sob a perspectiva de promoção de saúde e inclusão social.

**Palavras-chave:** Traumatismos em atletas; Atletas; Ortopedia.

## INTRODUCTION

Played in more than 120 countries, rugby is extremely popular, especially in British colonial countries such as the UK, Ireland, Australia, New Zealand and South Africa.<sup>(1)</sup> From the 90s, began professionalism process of athletes with increasing media attention and greater investment to this sport.<sup>(2)</sup> Similarly, there has been increasing scientific interest about this sport, especially trying to understand what the requirements of the game and the characteristics of the players associated with better performance, in order to achieve the maximization of the training and the results.<sup>(3)</sup>

In Brazil, the rugby practice started around 1920 in Sao Paulo and is still considered a sport in development, with few teams competition. However, the rugby fans have been growing very rapidly with increasing number of practitioners in the country, influencing mainly by the inclusion of the sport in the Olympic Games from 2016 in the city of Rio de Janeiro.<sup>(1)</sup> In the state of Maranhão, rugby is developed with shares of Associação Maranhense de Rugby (AMARU), which was established in 2011 by a player who played professionally in Australia, and currently consists of 52 people who strive to promote the development of sport, both within competitive and in its social aspects.<sup>(4)</sup>

Within the game dynamics, one must consider that rugby provides high collision space imposing a powerful body contact and potentially exposing players to a large number of injuries. Differences in skills and abilities, soil conditions, arbitration patterns and attitudes of aggression and violence, influence injury rates, which may be higher in amateur rugby players.<sup>(5)</sup>

The nature of rugby, combined with the absence of the necessary protective equipment, contribute to the high

risk of injury associated with this sport.<sup>(6)</sup> To date have not find studies that better clarify the trauma-orthopedic injuries in rugby.

Given the above, the objective of this study was to investigate the trauma-orthopedic injuries in rugby players AMARU occurred during the first half of 2013. To this end, 22 players were interviewed using a semi-structured questionnaire that addressed among other issues, those related to the type and body region of involvement of the lesion, as well as sociodemographic players.

## METHODS

The design of the research meets the characteristics of a cross-sectional study of a descriptive nature. For its development, we used a semi-structured questionnaire which addressed 11 questions distributed in the following variables: ethnicity, education, rugby practice time, position in the game, if you have suffered some trauma and orthopedic injury, the injury occurred during the game or practice, a situation which the injury occurred, part of the body affected, type of injury and extrinsic variables which were most relevant to the occurrence of the injury. The study complied with the ethical principles of research involving human subjects and was approved by the Research Ethics Committee of the Faculdade Inspirar with the number protocol 310.070.

Data collection was based on the injuries occurred during the month of January to July 2013. The population was composed of 22 players, where 100% adhered to participation in the study. After agreeing to participate in it, the players signed the free and informed consent form and then immediately answered the survey questions individually.

Data obtained by questionnaire were presented in absolute and relative terms (percentage of occurrence) using descriptive statistics.

## RESULTS

Table 1 shows the anthropometric characteristics of the players interviewed. It was observed that respondents rugby practitioners showed a wide variation in age (18 to 44) and the total body weight (52-135 kg).

Table 2 shows the distribution of frequency and percentage relative to the following sociodemographic variables: ethnicity, education, rugby practice time and position in the game. These data revealed that this sport is practiced mainly by white and brown, with the completion of high school and at least 1 year of involvement with the sport.

Table 3 shows the frequency distribution and percentage relative to the variables directly related to the characterization of trauma and orthopedic injuries. Interestingly, most

**Table 1.** Anthropometric characterization of the players (n = 22).

Variable	Minimum	Maximum	Mean	Standard Deviation
Age (years)	18	44	26	6.7
Body mass (kg)	52	135	90.7	20.7
Height (cm)	1.51	2.00	1.76	0.12

**Table 2.** Socio-demographic variables of the players (n = 22).

Variable	N	%
<b>Skin Color</b>		
White	9	40.9
Brown	10	45.5
Black	3	13.6
<b>Education Level</b>		
Secondary School	12	54.5
Higher education	7	31.8
Specialist	4	18.2
<b>Rugby practice time</b>		
6 months	4	18.2
1 year	8	36.4
2 years	8	36.4
<b>Position in the game</b>		
Left Wing	4	18.2
Loosehead prop	5	22.7
Hooker	3	13.6
Inside centre	1	4.5
Fullback	3	13.6
Scrum	3	13.6
1 <sup>a</sup> row	1	4.5
2 <sup>a</sup> row	1	4.5
3 <sup>a</sup> row	1	4.5

practitioners did not suffer any injuries with the practice of rugby. However, 45.5% reported having experienced some type of trauma-orthopedic injury.

In this case, most of the players have suffered injury to the shoulder area, knee and ankle drawn or pulled muscle during training, the tackle position, and fundamentally attributed to the lawn condition and extrinsic variable responsible for the injury.

## DISCUSSION

Rugby is a sport growing in popularity worldwide, but there are still a limited number of studies (mainly in Brazil) about this sport as well as research on trauma and orthopedic injuries arising from this practice. Due to the intense physical contact associated with the high metabolic demand and physical required by rugby,

**Table 3.** Characterization of trauma-orthopedic injuries in AMARU<sup>1</sup> rugby practitioners (n = 22).

Variable	N	%
<b>Suffered some trauma and orthopedic injury</b>		
Yes	10	45.5
No	12	54.5
<b>The injury occurs during</b>		
Training	7	70.0
Game	3	30.0
<b>Situation that occurred injury</b>		
Slowdown	1	10.0
Run	2	20.0
Tackle	7	70.0
<b>Body region affected by injury</b>		
Sholder	6	60.0
Elbow	1	10.0
Wrist	3	30.0
Thigh	1	10.0
Knee	5	50.0
Ankle	5	50.0
Back	1	10.0
<b>Injury type</b>		
Strech or muscle strain	5	50.0
Sprain	3	30.0
Contusion	3	30.0
Dislocation	3	30.0
<b>Extrinsic variables</b>		
Lawn conditions	6	60.0
Games Count	1	10.0
Amount of training	1	10.0
Physical/health condition	1	10.0
Others	1	10.0

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have been reported considerable injury rates, being a determinant of this high amount of collision and the reduced use of equipment for physical protection.<sup>(5,7)</sup> Thus, the purpose of this study was to investigate the report of rugby amateur players of AMARU about their trauma and orthopedic injuries.

An epidemiological study featuring the incidence, nature and the severity of injury in rugby from September to October of 2001, the most common cause of injuries during the games, is the physical contact between players.<sup>(8)</sup> Alves et al.<sup>(5)</sup> gathered data on injuries occurring in rugby leagues in New Zealand and Australia, and identified a high causal relationship with the tackle. According to Fuller et al.<sup>(9)</sup> the tackle can be described as an act to prevent in any way that the ball carrier runs with the same passing it or joining it to another member of his team.

In a cohort study that included 645 professional rugby players of 13 English clubs for two seasons (2003-2004 and 2005-2006) it was observed that most lesions (24-58%) are also caused in the tackle.<sup>(10)</sup> In the present study, this information is highlighted as it was pointed out that the main cause of injury situation is the tackle.

Whereas the most affected area of the body with the practice rugby, it was observed that the shoulder, knee and ankle accounted for the vast majority of reports (60%, 50% and 50%, respectively). This result is also in line with the study of Comstock and Yard<sup>(6)</sup> on injury suffered by rugby players attended by US emergency departments from 1978 to 2004, which revealed that the shoulder, knee and ankle were the most local often injured.

Crichton et al.<sup>(10)</sup> in a study with 24 players in the semi professional in a period of four years and revealed that the shoulder was the joint often affected with a prevalence of 7.7%. The analysis of muscle activity patterns and isokinetic strength of semi professional rugby done by Bolton et al.<sup>(11)</sup> showed that shoulder injuries are the most serious in this sport, accounting for almost 20% of injuries related to sports.

By analyzing the type of injury reported by players AMARU, the muscle strain was identified as the most frequent. In the United States, sprains, lacerations, fractures, bruises and abrasions has been more frequently diagnosed in professional athletes.<sup>(6)</sup> This difference can be understood by patterns and playing styles, use of accessories and conditions of the lawn, beyond the proper condition existing training between amateur and professional players.

Considering that respondents players are amateurs and do not enjoy adequate professional structure, the lawn was cited by most as the most relevant factor for the occurrence of injury. This result was different to the literature, since the basis of the studies found was performed with professional players. The physical nature of the players, combined with the lack of necessary

protective equipment contribute to the high risk of injury associated with this sport.

Rugby is a sport that requires fast, strong, agile and tough players, so they can contribute their skills during the game, and that a training program, understand the key components of the physiological and physical demands of the sport.<sup>(12)</sup>

Lopes et al.<sup>(13)</sup> state that rugby is a sport that requires a variety of physiological responses from players because the game is marked by repetitive high-intensity running and body contact, which leads us to believe that a good condition physical is essential for reducing the number of injuries. Thus, it is essential training strategies that can better watch these athletes, whether amateur or professional.

In one of these strategies, Neves et al.<sup>(14)</sup> conducted a study with 68 children from a public school in Muzambinho/MG, including rugby and content of the physical education classes. Initially, the method was presented to students of adapted way, exchanging the traditional tackle by an act far less harmful: the removal of tags (2 laterally attached to ribbons shorts player). The action of removing one of the ball player tapes to stop the opponents attack avoids intense physical contact, which will possibly fewer injuries and more safety for young practitioners in the practice of rugby.

Information about the trauma and orthopedic injuries of amateur athletes favor preventive and training measures for increasing the popularity of the sport grow in our country. From the findings of this study, AMARU can better guide their actions for favoring rugby practice in the state of Maranhão mainly from the perspective of health promotion and social inclusion.

## CONCLUSION

Approximately 50% of rugby players of AMARU respondents report some trauma-orthopedic injury. In this case, most of the players have suffered injury to the shoulder area, knee and ankle drawn or pulled muscle during training, the tackle position, and fundamentally attributed to the lawn condition and extrinsic variable responsible for the injury.

## REFERENCES

1. Confederação Brasileira de Rugby. O rugby. São Paulo; 2010 [cited 2013 July 15]. Available from: <http://www.brasilrugby.com.br/>.
2. Duthie G, Pyne D, Hooper S. Applied physiology and game analysis of rugby union. *Sports Med.* 2003; 33(13):973-91. <http://dx.doi.org/10.2165/00007256-200333130-00003>. PMID:14606925.
3. Gabbett TJ. Science of rugby league football: a review. *J Sports Sci.* 2005 Sep;23(9):961-76. <http://dx.doi.org/10.1080/02640410400023381>. PMID:16195048.

4. Neres A. O rugby no Brasil. Maranhão: AMARU, 2011 [cited 2013 Jan 22]. Available from: <http://amaru.blog.com/o-rugby-no-brasil/>.
5. Alves LM, Soares RP, Liebano RE. Incidência de lesões na prática do rúgbi amador no Brasil. *Fisioter. Pesqui.* [Internet]. 2008;15(2):131-5.
6. Comstock RD, Yard QE. Injuries sustained by rugby players presenting to united states emergency departments, 1978 through 2004. *J Athl Train* [Internet]. 2006 [cited 2013 May 10];3(41):325-31. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1569558/>.
7. Kiefer T, Correa RAA, Lopes AC, Santos ES. Ocorrência de afastamento dos treinos por lesão em atletas de rugby. *Rev. Cienc. Saude.* 2009; Spec Nº:24.
8. Fuller CW, Sheerin K, Targett S. Rugby World Cup 2011: International Rugby Board Injury Surveillance Study. Auckland: University of Technology Private; 2013 [cited 2013 Sept 10]. Available from: [www.irbplayerwelfare.com](http://www.irbplayerwelfare.com).
9. Fuller CW, Brooks JH, Cancea RJ, Hall J, Kemp SP. Contact events in rugby union and their propensity to cause injury. *Br J Sports Med.* 2007 Dec;41(12):862-7. <http://dx.doi.org/10.1136/bjsm.2007.037499>. PMID:17513332.
10. Crichton J, Jones DR, Funk L. Mechanisms of traumatic shoulder injury in elite rugby players. *Br J Sports Med.* 2012 Jun;46(7):538-42. <http://dx.doi.org/10.1136/bjsports-2011-090688>. PMID:22510645.
11. Bolton G, Moss SJ, Sparks M, Venter PC. Thoracic posture, shoulder muscle activation patterns and isokinetic strength of semi-professional rugby union players. *S Afr J SM.* 2013; 25(1):12-7.
12. Takarada Y. Avaliação da Lesão muscular após uma partida de rugby, com referência especial para situação do tackle. *Sports Med.* 2003; 47:416-9.
13. Lopes AL, Sant'Ana RT, Baroni BM, Cunha GS, Radaelli R, Oliveira AR, et al. Perfil antropométrico e fisiológico de atletas brasileiros de "rugby". *Rev Bras Educ. Fís. Esporte.* 2011; 25(3):387-95.
14. Neves RBP, Venditti R Jr, Souza RA, Kocian RC, Pereira MC, Castelan LP, et al. Rugby na Escola?!... Perspectivas de uma proposta diversificada, pautada na pedagogia do esporte para a educação física escolar do ensino fundamental. *Colec. Pesqui. Educ. Fis.* 2013; 12(4):127-34.