EPIDEMIOLOGICAL PROFILE OF AMATEUR ATHLETES AT A MEDICAL SCHOOL IN THE CITY OF SÃO PAULO

PERFIL EPIDEMIOLÓGICO DE ATLETAS AMADORES EM FACULDADE DE MEDICINA DA CIDADE DE SÃO PAULO

PERFIL EPIDEMIOLÓGICO DE DEPORTISTAS AMATEURS DE UNA FACULTAD DE MEDICINA DE LA CIUDAD DE SÃO PAULO

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ABSTRACT

Introduction: Epidemiologic data about sports injuries among college athletes in Brazil is scarce. The aim of this study was to analyze the epidemiology of sports injuries in a single center. Methods: We interviewed 262 athletes from 10 different sports retrospectively about injuries sustained in their university careers and whose injuries sustained during one season were monitored prospectively. The characterization of the injuries included data on the location of the injury, type of injury, time of year, injury mechanism, and the moment of the injury during training or a game. Results: In the university history, the incidence of injuries was higher in men (81.5%) than in women (67.8%). Lower limb injuries were the most frequent both in the university history and the season. The sports with the highest injury rate for the season was handball (34.2%) and for the university history was basketball (80.8%). The main injury mechanism was non-contact. The months with the highest incidence of injuries were those at the beginning of the season (53.3%). The most frequent diagnoses were ligament injuries, followed by fractures. Both the presence of a previous injury in the same region and the practice of weight training were predictive factors for injury. Conclusion: College athletes at this center are more likely to suffer injuries during the first months of the season, especially in contact sports involving lower limbs. ***Level of Evidence III; Study of non-consecutive patients, without uniformly applied "gold" reference standard***.

Keywords: Sports injuries; Epidemiology; Athletes.

RESUMO

Introdução: Há escassez de dados no Brasil sobre a epidemiologia de lesões esportivas em atletas universitários. O objetivo deste estudo é fazer uma análise sobre a epidemiologia das lesões esportivas em um único centro. Métodos: Foram entrevistados 262 atletas de 10 esportes diferentes, de forma retrospectiva, com relação às lesões sofridas em seu histórico universitário e foram acompanhados de forma prospectiva quanto às lesões sofridas ao longo de uma temporada. A caracterização das lesões contava com dados de local da lesão, tipo de lesão, época do ano, mecanismo de lesão, momento de ocorrência da lesão durante treino ou jogo. Resultados: No histórico universitário, a incidência de lesões foi maior em homens (81,5%) do que em mulheres (67,8%). As lesões de membros inferiores foram as mais frequentes tanto no histórico universitário, quanto na temporada. O esporte com maior índice de lesão na temporada foi o handebol (34,2%) e no histórico universitário foi o basquete (80,8%). O principal mecanismo de lesão foi sem contato. Os meses de maior incidência de lesão são os do começo da temporada (53,3%). Os diagnósticos mais frequentes são as lesões ligamentares, seguidas por fraturas. Tanto a presença de lesão prévia na mesma topografia, quanto a prática de musculação foram fatores preditivos de lesão. Conclusões: Os atletas universitários deste centro estão mais susceptíveis a sofrer lesões durante os primeiros meses da temporada, especialmente em esportes de contato e maior incidência nos membros inferiores. ***Nível de Evidência III; Estudo de pacientes não consecutivos, sem padrão de referência "ouro" aplicado uniformemente.***

Descritores: *Lesões esportivas; Epidemiologia; Atletas.*

RESUMEN

Introducción: Hay muy pocos datos en Brasil sobre la epidemiologia de las lesiones deportivas en atletas universitarios. El objetivo de este estudio es analizar la epidemiologia de las lesiones en deportes en un único centro. Métodos: Fueron entrevistados 262 atletas de 10 deportes distintos retrospectivamente con respecto a las lesiones sufridas en su historial universitario y fueron acompañados prospectivamente con respecto a las lesiones sufridas durante una temporada. La caracterización de las lesiones se basó en los datos del lugar de la lesión, el tipo de lesión, la época del año, el mecanismo de la lesión y el momento en que se produjo la lesión durante el entrenamiento o el partido. Resultados: En el historial universitario, la incidencia de las lesiones fue mayor en los hombres (81,5%) que en las mujeres (67,8%). Las lesiones en los miembros inferiores fueron más frecuentes tanto en el historial universitario como en la temporada. El deporte con mayor índice de lesiones en la temporada fue el balonmano (34,2%) y en el historial universitario fue el baloncesto (80,8%). El principal mecanismo de lesión fue sin contacto. Los meses con

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mayor incidencia de lesiones son el inicio de la temporada (53,3%). Los diagnósticos más frecuentes son las lesiones de ligamentos seguida de las fracturas. Tanto la presencia de una lesión previa en la misma topografía como la práctica de musculación fueron factores predictivos de lesión. Conclusiones: Los atletas universitarios de esta institución son más susceptibles de sufrir lesiones durante los primeros meses de la temporada, especialmente en los deportes de contacto y con mayor incidencia en los miembros inferiores. ***Nivel de evidencia III; Estudio de pacientes no consecutivos, sin patrón "oro" de referencia aplicado uniformemente.***

Descriptores: Lesiones en deportes; Epidemiología; Atletas.

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INTRODUCTION

Sports injuries can affect the life of the college athlete in diverse ways, including financially, psychologically, and physiologically, highlighting the need for prevention.[1] The first step in designing prevention measures to reduce the incidence and severity of sports injuries is to identify and describe them.[2]

In 1982, the Injury Surveillance System (ISS) was created by the National Collegiate Athletic Association (NCAA) with the objective of collecting data about injuries and exposure from a sample of athletes from several universities from all over the USA.[3] Over time, the database provided by the ISS has become the main source of knowledge in the field of sports medicine, supporting the implementation of policies and rule changes focused on improving the health and safety of college athletes.[3,4]

In Brazil, college sports are not as prevalent as in the USA and there is a scarcity of information about the epidemiology of injuries in college athletes.[5] The objective of this study was to analyze data on the epidemiology of sports injuries among college athletes at a medical school.

METHODS

For the data survey, two questionnaires based on the ISS were applied. The first questionnaire was administered digitally via the Google Forms application at the beginning of the season. The questionnaire included questions related to anthropometry, underlying diseases, continuous-use medications, training routines before and after entering medical school, and the history of the athlete's injuries, covering the causes, diagnoses, and treatments.

The other questionnaire, targeted at monitoring the registered athletes, was also applied via Google Forms, and was administered for each injury that occurred during the season to analyze the evolution of injuries in this group of athletes. This questionnaire posed questions that addressed exclusively the injury that had just occurred, covering causes, diagnosis, treatment, and the moment in training or in the game at which it occurred.

The sports included in this study were judo, swimming, track, baseball, volleyball, basketball, handball, soccer, futsal, and table tennis.

Injuries that resulted in an absence of at least one day and sports involving at least seven athletes were included. The season was defined as the period from January to November 2018.

Statistical Analysis

All analysis was performed using the SPSS v13.0 program. For the descriptive data analysis, summary measures (mean, median, SD, minimum, and maximum) were calculated for the quantitative variables and absolute (n) and relative (%) frequencies for the qualitative variables. The chi-squared test or Fisher's exact test, when necessary, were used to evaluate the inference between the qualitative variables. The level of significance adopted for all tests was 5%.

RESULTS

Of the 262 athletes interviewed, 85.8% (225) responded to the questionnaire properly, 76% (171) of whom were injured at sometime during their university sports career and 23.10% (52) of whom had been injured at least once during the season. The mean age of the athletes was 23.29 years and their mean BMI was 23.8 kg/m^2.

Among the men, 81.5% (110, p=0.018) had already been injured while playing sports in college, while among women, the percentage was 67.8% (61, p=0.018). During the season, these values dropped to 22.2% (30, p=0.698) and 24.4% (24, p=0.698), respectively. Throughout the university history, the sport with the highest incidence of injuries was basketball (80.8%, p=0.014), while, during the season, handball (34.20%, p=0.033) had the highest incidence of injuries, as shown in Table 1.

Figure 1 shows the parts of the body with the highest incidence of injuries. The ankle and the knee were the most often injured body parts both in the university history and the season. Injured ligaments and fractures were the most common diagnoses in both the university history and the season, as shown in Figure 2.

The main injury mechanism in both questionnaires was non-contact, followed by contact with another player, as shown in Figure 3. When analyzing the frequency distribution of the injuries over the season, we observed that February, March, and April account for 53.3% of the injuries for the whole season (Figure 4).

Table 1. Percentages of athletes injured for the season and the university history by sport.

Sport	In the season	P value	In the university history	P value
Handball	34.20%	0.033	89.50%	0.075
Basketball	42.30%	0.545	80.80%	0.014
Swimming	22.20%	0.149	61.10%	1.000
Futsal	33.30%	0.397	81.80%	0.132
Soccer	12.50%	0.555	71.90%	0.124
Baseball	25.00%	0.789	80.00%	0.786
Volleyball	17.40%	0.021	56.50%	0.492
Table Tennis	18.20%	0.301	63.60%	1.000
Judo	22.70%	0.085	90.90%	0.964
Track	14.70%	0.944	76.50%	0.207

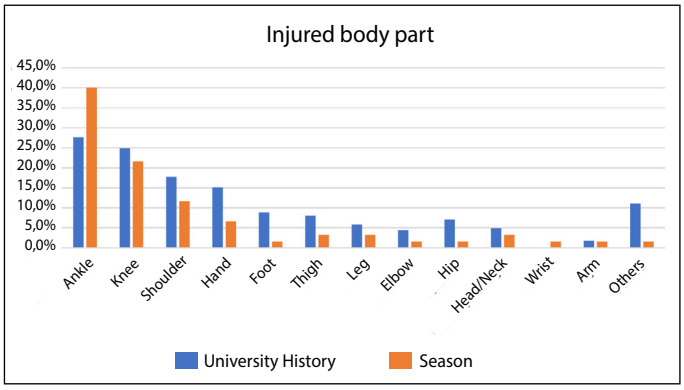

Figure 1. Percentages of university history and season injuries by body part.

Of the athletes who had reported previous injuries at the beginning of the season, 40.6% (p=0.046) were injured, while only 23.4% (p=0.046) of the athletes who had not had a previous injury were injured. The incidence of injuries of both university history and season injuries was higher among the athletes who practice weight training (79.1%, p=0.024 and 26.4%, p=0.017, respectively) (Table 2).

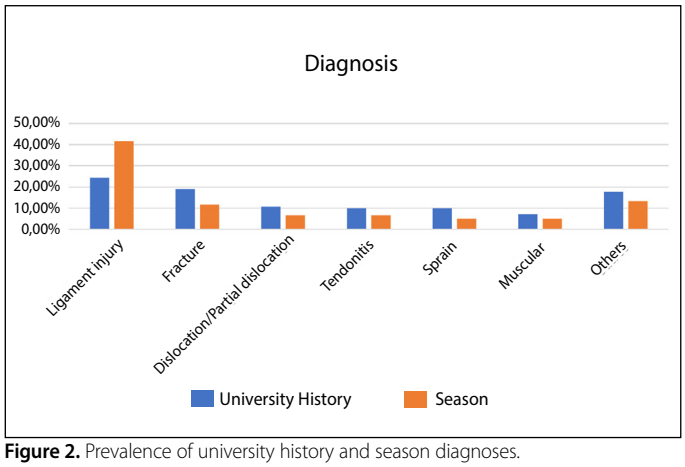

Figure 2. Prevalence of university history and season diagnoses.

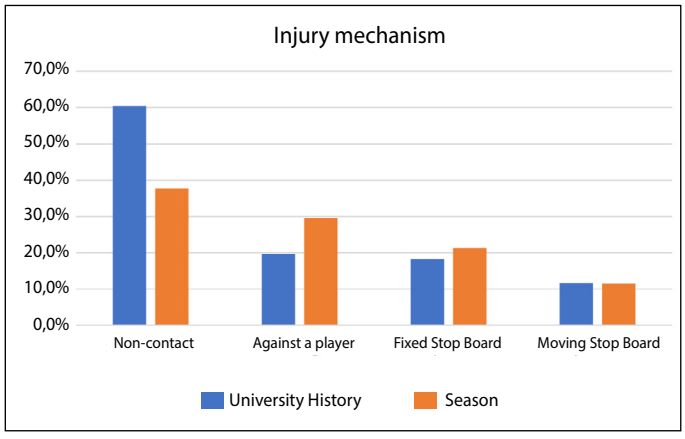

Figure 3. University history and season injury mechanisms by percentage.

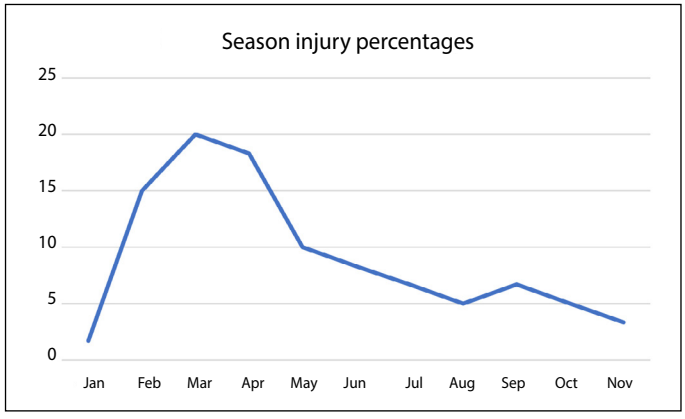

Figure 4. Injury distribution percentages during the season.

Table 2. Predictive factors for injuries.

		% of injured athletes in the university history (frequency)	P value	% of injured athletes during the season (frequency)	P value
Weight training	Yes	79.1% (144)	p=0.024	26.4% (48)	p=0.017
	No	62.8% (27)		9.3% (4)	
Previous injury	Yes	93.8% (30)	p=0.297	40.6% (13)	p=0.046
	No	97.2% (141)		23.4% (34)	

DISCUSSION

In the present study, it was found that the months with the highest number of injuries were the months at the beginning of the season, that is, February, March, and April. Although the training intensity of the study population is higher closer to September, the athletes are in poorer physical condition during the first months of the year. Some studies report a higher incidence of injuries during the pre-season period, when the athletes experience difficulties related to a lesser level of fitness, as well as to vying for positions on the teams.[1,6]

More than 50% of the university history and season injuries recorded were of the lower limbs, in concordance with other findings in the literature.[1,4,5,7,8] Other studies conducted in Brazil and in the USA indicate a higher incidence of lower limb injuries, especially torsional knee and ankle injuries.[5,7] The results of the present study also highlight the need for attention to prevention and determination of the mechanisms of the injuries due to their high incidence.

Ligament injuries and fractures were among the most frequent diagnoses, in agreement with other studies conducted in the USA.[1] The most frequent injury mechanism in both the university history and the season was non-contact (60.4% and 37.7%, respectively), in contrast to the NCAA findings in which the main mechanism was contact with another player.[9] Considering that ligament injuries and fractures are acute injury diagnoses and, therefore, mostly caused by a trauma mechanism,[8,10] we had expected that injury mechanisms involving contact would be more prevalent. This finding can be explained by the lesser physical preparation and technical refinement of amateur players, leading to a higher incidence of injuries due to incorrect sports moves and muscle fatigue. This difference in the prevalence of injury mechanisms in university sports between Brazilian and American studies has also been observed in previous studies.[4]

Among the sports analyzed, those with the highest indices of injuries in the university history and in the season, were handball and basketball, respectively. These are sports with intense jumping, landing, and rapid changes of direction, which are mechanisms of great importance for lower limb injuries.[11,12,13] During the season, the sport with the second highest injury rate was volleyball (17.4%, p=0.021), which also involves jumping, landing, and rapid changes of direction,[11] although there is less physical contact than handball and basketball.[1]

During the season, the athletes who had had previous injuries were more susceptible to new injuries. In another study conducted with NCAA basketball athletes, a previous ankle sprain was the main predictive factor for new sprains.[12] This relationship may be due to deficiencies remaining from the first injury or from inadequate rehabilitation.[6] Another factor that was associated with a greater predisposition for injury is the practice of weight training. In both the university history and the season, athletes who practiced body building were more susceptible to injury. Further studies are necessary to clarify this relationship.

Limitations of the study

The retrospective nature of the questionnaire about the university injury history left data collection open to biases, such as lapses in the athletes' memories, leading to a loss of data precision. Another limitation of the study lies in the fact that the athletes answered the questionnaires themselves, who often did not have enough detailed information to characterize their own injuries.

CONCLUSION

The college athletes at this center are more likely to suffer injuries during the first months of the season, especially in contact sports involving the lower limbs. Future studies should focus on these limitations when collecting Brazilian university sports data, as they are the biggest obstacle to building solid databases in the country that can be used to design protection measures for athletes.

All authors declare no potential conflict of interest related to this article

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