INCIDENCE OF MUSCULOSKELETAL INJURY IN SOCCER PLAYERS

ORIGINAL ARTICLE

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ABSTRACT

Soccer is a popular sport worldwide, especially in Brazil; therefore, several studies have tried to make a profile of injuries and players more prone to it; however, this kind of study is rare in the northern region of our country. The general aim of this study was to analyze the incidence of musculoskeletal injuries on professional soccer players of Remo Club. Methods: 27 professional soccer players of Remo Club were analyzed during the State Championship of Pará in 2010. Data were collected through verification of records and application of a semi-coded questionnaire to the athletes and a; statistical analysis was subsequently applied. Results: By analyzing the sample, it was found that most of the injuries were contractures and contusions, the most affected body site was the thigh and the knee and the athletes who suffered the most injuries were the midfielders. Conclusion: Several muscles injuries have occurred; therefore, assistance of the medical staff is needed, since this kind of injury does not occur due to trauma, but rather due to the movements imposed to the players during games and training. Thus, adequate physical preparation can reduce the incidence of this type of injury.

Keywords: alteration, musculoskeletal, athletes.

INTRODUCTION

Soccer is the most popular sport in the world[1]. Injuries I soccer have increased in number, since it is a sport characterized by intense physical contact, short, fast and non-continuous movements, such as acceleration, deceleration, jumps and sudden changes of direction[2].

Prevention and onset of orthopedic injuries in soccer are based on intrinsic or personal factors such as: age, previous injuries, articular instability, physical preparation and ability, while the extrinsic factors are: exercise overload, excessive number of games, field quality, inadequate equipment and the game's rules violation (excessive fouls and violent moves)[3]. The visible advance of the sports medicine has enabled greater knowledge about the exertion physiology, allowing hence that specific protocols for each athlete are designed according to his characteristics[4].

During a soccer game, an athlete completes about 10 km, divided in running (40%), walking (25%), trotting (15%), velocity (10%) and backward running (10%). A characteristic of soccer is the presence of rough moves at every six seconds, facilitating the onset of injuries[5].

In the USA, the National Collegiate Athletic Association (NCAA) of the Injury Surveillance System (ISS) indicates as sports injuries those which limit the athlete's participation for at least one day after, the episode which caused the injury. The NCAA classifies injuries according to the time of inability for sports practice, and it can be a light (from one to seven days of time away from practice), moderate (from eight to 21 days) and severe (more than 21 days or with permanent injury)[6].

In a study held in 2009, with professional players of Marília Athletic Club, the injury with the highest incidence was muscular[2]. In another investigation carried out in the same year, the most frequent injury found was the ankle sprain, followed by knee trauma and muscular injury[7].

In 2000 it was verified that the players who acted in the Australian Soccer League were unable to play for 0.7 to 9.2 games due to knee injuries[8]. In Pará state, soccer is widely popular, both professional and amateur, which may cause a high level of musculoskeletal injuries when it is played without guidance. Observing the frequency and the associated factors to injuries may expose the best way to deal with the athletes'health, always searching for prevention of osteomuscular problems. Another point which justifies the interest to perform this study is the low number of published articles which approach this issue in a regional and local context.

Therefore, we tried to analyze the incidence of musculoskeletal injuries in soccer players of Remo Club during the state championship of Pará in the year of 2010, checking the traumato-orthopedic injury, body site, level of the injury and the most frequent injury mechanism in the professional players; what position on the field is the most prone to injury; the time the injury places the player away from training and games in the championship; if the injury incidence is higher during training or games and if there is any correlation with age of the player.

METHODS

The research was submitted to and approved by the Ethics in Research Committee (CEP) of the University Center of Pará (CESUPA), CAAE: 5588.0.000.323-09. All individuals of the present study were studied following the guidelines of research involving human beings (Res. CNS 196/96) of the National Health Board.

The research was held in the Evandro Almeida soccer stadium (Remo Club) checking the medical records of the soccer players, concomitantly to the injury onset, during the whole season. It is a cohort

observational and prospective study. The studied population was composed of 27 members of the professional soccer team of Remo Club. Data collection was carried out from January to June, 2010.

The responsible for the medical department signed na acceptance form on the side of the institution; the Free and Clarified Consent Form was signed by the players who participated in the research. Subsequently, a semi-codified data collection form was applied by the authors of the research to the athletes in the beginning of the pre-season. Information on physical and socio-economical characteristics such as age, height, weight, race, marital status, nationality and whether they had an alternative job was collected. Characteristics of soccer practice: time of soccer practice, injury history, and surgeries due to sports injuries.

After recording of this information, data concerning the characteristics of sports injuries which occurred such as: type of injury, whether or not the injury occurred during games or training, body site affected, injury mechanism, position on the field of the player and time the player was away from sports practice was collected. For this study, sports injury was considered the one in which the athlete remained up to 24 hours unable to act in his sports practice, after the event which caused injury, according to classification by ISS (Injury Surveillance System).

After data collection from the medical records, the information was typed and fed to a database for their statistical analysis. The database as well as tables and figures were made on, Microsoft Excel 2003. The BioEstat 5.0 software was used for data analysis using the Student's t test for analysis of statistical significance of the obtained results and alpha level of significance considered was 0.05 (5%).

RESULTS

The research had participation of 27 players, minimum age of 20 and maximum age of 35 years (25.8 ± 4.8), minimum weight of 63 and maximum of 88 kg (74.0 ± 6.5), minimum height of 1.66 and maximum of 1.88 cm (1.78 ± 0.06). Remo Club has in its professional team: three goalkeepers, four central forwards, five midfield sweepers, five forwards and tem midfielders.

In the studied sample, 15 (55.6%) athletes presented musculoskeletal injuries during the championship and 12 (44.4%) did not present any kind of injury, while 14 (93.3%) of the injured players had already presented injury history. Concerning surgery history due to orthopedic injuries, only two (13.3%) athletes had already undergone them.

23 injuries were found, since there were players who got injured more than once. The types of injury with the highest incidence were contractures and contusions, both with 26.% (table 1). Concerning the body site most referred, the thigh and the knee presented the highest index, both with 34.8% (table 2).

The most frequent injury mechanism was the indirect mechanism, corresponding to 59.1%, while the direct mechanism corresponded to 40.9%. The injuries occurred in their majority in the games, with a total of 65.2%; while in training this value was 34.8%. Concerning the time away from the spots of the players, the longest was 20 days (4.3%) and seven players (30.4%) were away for four days (table 3). The NCAA classifies light injury as maximum time away from the sport of seven days; hence there was 83% of this injury level (figure 1).

Table 1. Type of injury of the soccer players of Remo Club during the State Championship of Pará of 2010.

Type of Injury	Quantity	Percentage
Contractures	6	26.1
Contusions	6	26.1
Muscle strains	2	8.7
Strains	2	8.7
Sprains	1	4.3
Bruises	2	8.7
Groin disruption	1	4.3
Tendinitis	3	13.0
Total	23	100.0

Source: Field research, 2010.

Table 2. Body site of the injury of the soccer players of Remo Club during the State Championship of Pará of 2010.

Site injured	Quantity	Percentage
Forearm	1	4.3
Head	1	4.3
Pelvic waist	1	4.3
Thigh	8	34.8
Knee	8	34.8
Shoulder	2	8.7
Foot	1	4.3
Ankle	1	4.3
Total	23	100.0

Source: Field research, 2010.

Table 3. Time away from the soccer players of Remo Club during the State Championship of Pará of 2010.

Time away (days)	Quantity	Percentage
Two	4	17.4
Three	2	8.7
Four	7	30.4
Five	4	17.4
Seven	2	8.7
Eight	1	4.3
Ten	2	8.7
Twenty	1	4.3
Total	23	100.0

Source: Field research , 2010.

When age was assessed with injury incidence, the age range between 29 and 33 years was the ones which presented the highest level, corresponding to 35% (figure 2). Concerning the possible relation between age of players and injury incidence, the Student's t test presented a $p = 0.026$ value, considered statistically significant.

Regarding the relation between position on the field and frequency of the injury, higher number of injuries was observed in the midfielders, (46.7%), followed by the midfield sweepers (20%) (table 4).

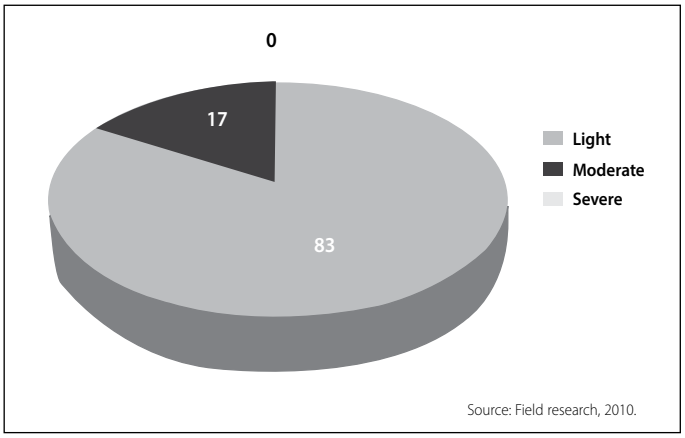

Figure 1. Severity of the injury of soccer players of Remo Club during the State Championship of 2010.

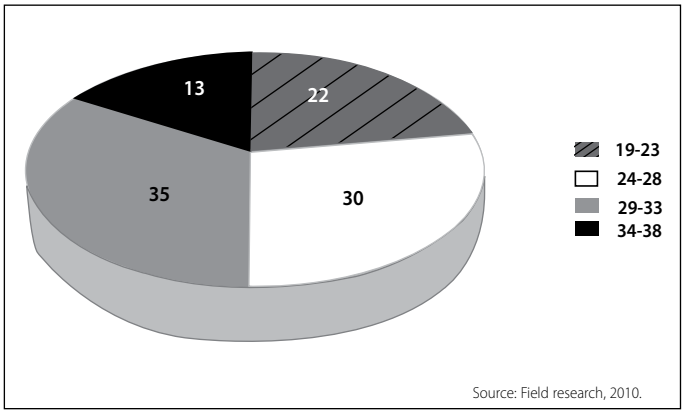

Figure 2. Age x Incidence of Injury in soccer players of Remo Club during the State Championship of Pará of 2010.

Table 4. Position on the field x Incidence of the players of Remo Club who got injured and did not get injured during the State Championship of Pará of 2010.

Position on the field	Quantity	Percentage
Forward	5	18.5
Goalkeeper	3	11.1
Wingback	5	18.5
Midfielder	10	37.0
Central forward	4	14.8
Total	27	100.0

Source: Field research, 2010.

DISCUSSION

The present study investigated in a retrospective analysis the incidence of musculoskeletal injury of 27 professional soccer players who acted in Remo Club during the state championship of Pará of 2010.

In the studies carried out by Freitas *et al.*[9] in 2005, they showed that the most frequent injuries are contusions (50%). This research agrees with them, since it found the highest incidence of contusions and contractures. The investigation by Waldén *et al.*[10] in 2005 found out that the most reported kind of injury was the sprains, this work is different from the findings. However, many articles mention muscular injury as the main musculoskeletal alteration which occurs to athletes[4,11].

Silva *et al.*[12] in 2008 stated in their research that the most affected body sites were the thighs and the knees, which is similar to the data found in the present article. The data show that the majority of the injuries occurred on the lower limb, being these predominately muscular. This type of injury occurs when there is high demand from the limb, which when taken to fatigue is more prone to injury, besides the several situations to which the athletes is exposed during the games[13].

According to Cohen, Abdalla, Ejnisman and Amaro[4], in 1997, the injuries occurred in their majority by indirect mechanism (59.3%), which corroborates the present study. Such fact can be explained by the great part of the injuries found in our study being muscular injuries, which occur when the player performs a fast and explosive contraction[14].

In an investigation by Waldén *et al.*[15] in 2005, involving European clubs, the orthopedic injuries occurred in their majority during the games (55%). In the present study injuries during games have also been reported as the most frequent. The same author verified in his research that the osteomuscular injuries put the athletes away from the sports up to a maximum of 81.9 days. In the present study, this number reached only 20 days, which makes it clear that the injuries found in the Remo Club's athletes are of less severity, leading hence to faster recovery. Consequently, the most found injury level was the light one, with maximum time of up to seven days away from practice. In the investigation by Morgan and Oberlander in 2001[16], it was observed that the light injuries were predominant in the studied sample (59%), which corroborates the findings in this article.

In a study carried out by Barbosa and Carvalho[17] in 2008 with Ipatinga Football Club –MG's players, the most sensitive to injury age range was the one between 31 and 35 years. Thus statement partially agrees with the result of this research, where the age range which suffered the most injuries was from 29 to 33 years. According to this author, the resulto f the chi-square test evidences that the difference between age and injury incidence is not statistically significant ($p = 0.180$), but in the present study the Student's t test presented a $p = 0.026$ value considered statistically significant for the same ratio.

According to Raymundo *et al.*[18], in 2005, the position on the field most prone to develop traumato-orthopedic injury would be midfielder sweepers, forwards and goalkeepers. Dória, Morais, Prota and Mendes[19], in 2005, in a club of Minas Gerais, verified that the injuries occur mainly forwards, goalkeepers and midfielders. These data are not in agreement with the findings in this research, since the most injured were midfielders, midfielder sweepers and forwards.

It was observed that the most frequent types of musculoskeletal injury are contusions and contractures. The most affected body sites are the thigh and the knee. Additionally, it was verified that the indirect injury mechanism is more frequent.

Due to intense physical contact and great demand over the players during games, the place where most musculoskeletal alterations occur is during the games. Concerning the time away from the sport, during the championship, the majority of the athletes were four days away from their soccer activities, being the light level most frequent.

The present study evidenced that the injury incidence is higher in midfielders. The age range between 29 and 33 years was the most injured. The Student's t test presented a $p = 0.026$ value for the age and injury incidence ratio, being it statistically significant.

Many muscular injuries have been reported; therefore, a follow-up from the multidisciplinary staff becomes necessary, since ,this type of injury does not occur due to trauma, but rather due to the moves the players are imposed to during the games and training.

CONCLUSION

Several muscles injuries have occurred; therefore, assistance of the medical staff is needed, since this kind of injury does not occur due to trauma, but rather due to the movements imposed to the players during games and training. Thus, adequate physical preparation can reduce the incidence of this type of injury.

All authors have declared there is not any potential conflict of interests concerning this article.

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