

Survey on the occurrence of dental trauma and preventive strategies among Brazilian professional soccer players

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ABSTRACT

Objectives: The aims of this study were to verify the occurrence of dental injuries in professional Brazilian soccer players, the level of knowledge of the teams' medical departments about mouthguards, and the conducts adopted in cases of dental trauma during the match. **Material and Methods:** Closed questionnaires were sent to the physicians in charge of the medical departments of the 40 teams enrolled in the first and second divisions of the Brazilian professional soccer league in 2007. The data obtained were subjected to descriptive analysis to determine absolute and relative frequencies of answers for each one of the questions. **Results:** Physicians from 38 (95%) of the 40 teams in the first and second divisions answered the questionnaires and 71.1% reported the occurrence of some type of dental injury during soccer practice, dental fractures (74.1%) and avulsions (59.3%) being the most prevalent ones. Regarding emergency conducts, approximately 50% answered that a successful replantation could be obtained in periods from 6 to 24 h after injury, and 27.8% were not able to answer this question. Regarding mouthguard use, 48.6% of the physicians did not know about mouthguards, and only 21.6% usually recommended their use by the soccer players. Among the physicians who do not recommend the use of mouthguards, 50% justified that it was not necessary. Almost 50% of the medical departments do not have a dentist as part of the health professional staff. **Conclusions:** It was possible to conclude that dental injuries are common during professional soccer practice and that there is a lack of information in the medical departments related to the emergency conducts and prevention of dental trauma.

Key words: Athletic injuries. Soccer. Tooth injuries. Accident prevention. Mouthguards.

INTRODUCTION

Dental trauma is considered a major public oral health problem because the high prevalence and the impact caused in daily life²¹. The main causes of traumatic dental injuries are falls and collisions with people and objects, both factors are very present during sports practice^{3,11,18,19}.

It has been shown that sports practice increases the risk of traumatic injuries such as dental trauma⁵. In the activities where contacts with athletes commonly occur, there is more susceptibility to

dangerous falls or blows, and consequently, to dental injuries^{1,4,22}. The modalities with increased risk are the contact sports such as wrestling and collective sports²².

Despite the common belief that soccer is not a violent sport, it presents a high risk of injuries to the athletes, including oral and craniofacial injuries⁴. In fact, during soccer matches the head is frequently used² and the impact between heads or head and elbow are the most prevalent causes of craniofacial injuries¹². In Europe, soccer is responsible for 50% of sports related to orofacial trauma, probably due

to the high popularity of this sport in the continent²⁰.

Several studies have demonstrated that oral health directly influences the players' performance. Dental trauma, which is a problem that can be prevented, should not affect the amateur and professional soccer practice. Several authors mentioned that mouthguard use could prevent the orofacial injuries in different kinds of sports^{5,17}. In spite of this, mouthguard use is not common worldwide¹⁵. Soccer is the most popular sport in Brazil, with thousand of players in the national, regional or local leagues. In Brazil, the use of mouthguards by the athletes is mandatory only in boxing practice. A literature review performed in indexed basis (PubMed, LILACS) showed that no study has investigated the occurrence and prevention of dental trauma in Brazilian professional soccer. Considering that an increased attention has been directed to Sports Dentistry, more investigations regarding dental trauma in sports should be performed.

The aim of this study was to perform a survey regarding the occurrence and prevention of dental trauma in professional soccer athletes by means of interviews with the medical departments of professional teams.

MATERIAL AND METHODS

Ethical Aspects

The study had the approval of the local Ethics Committee (Federal University of Pelotas, RS, Brazil). Each physician in charge for the medical department of the soccer teams invited to participate

in the study received an informational document about the research and signed an informed consent form prior to enrollment in the study.

Elaboration and delivery of the questionnaire

For this study, a closed questionnaire (Tables 1-3) was prepared and sent to the head of the medical departments of the 40 teams that were enrolled in the first and second divisions of Brazilian professional league soccer in 2007. To be included in the study, physicians needed to be working at the medical departments for at least 1 year. The questionnaire contained questions about the occurrence of traumatic dental injuries during the matches, the conducts adopted in cases of dental trauma, the knowledge of mouthguards, and the existence of a dentist as part of the team's health professional staff.

The questionnaires with the informational document were posted by regular mail including envelopes stamped to ensure the return of the answers. The questionnaire used was based on an instrument validated in previous study¹⁴. The data obtained was subjected to descriptive analysis to determine absolute and relative frequencies of answers and 95% confidence intervals for each one of the questions.

RESULTS

Physicians from 38 (95%) of the 40 teams in the first and second divisions answered the questionnaires. All of them were working in the teams for a minimum of 1 year. Table 1 shows the

Table 1- Absolute and relative frequencies of dental trauma's occurrence-based questions in Brazilians soccer clubs, 2007 (CI: confidence interval)

Question	Answer	Absolut Frequency	% (95%CI)
Have you ever seen a dental injury in a professional soccer player?	1. Yes	27	71.1 (54.1-84.6)
	2. No	11	28.9 (15.4-45.9)
If yes, what kind of dental injury?	1. Avulsion	16	59.3 (44.3-73.6)
	2. Dental Fracture	20	74.1 (59.6-86.1)
	3. Dislocation	9	33.3 (20.9-49.3)
	4. Others	2	7.4 (1.3-17.5)
How many times did you presence a dental injury on players?	1. Once	5	18.5 (6.3-38.1)
	2. Twice to 4 times	14	51.9 (31.9-71.3)
	3. Up to 4 times	8	29.6 (13.7-50.2)
What's the players' position that they suffered dental trauma?	1. Goalkeeper	6	22.2 (11.5-35.9)
	2. Center Defender	12	44.4 (29.0-58.7)
	3. Full-Back	2	7.4 (2.2-19.2)
	4. Defensive midfielder	9	33.3 (21.2-48.8)
	5. Offensive midfielder	5	18.5 (8.6-31.4)
	6. Forward	16	59.2 (45.2-73.6)

questions about dental trauma occurrence and the absolute and relative frequencies of the obtained data.

Regarding the occurrence of dental trauma in professional soccer players, 71.1% of the physicians saw at least once in their professional experiences, and 29.6% of them saw more than 4 times. The most common types of dental injuries observed were dental fractures (74.1%) followed by avulsions (59.3%). The players most affected by

dental injuries were forwards (59.2%) and center defenders (44.4%).

When the physicians were questioned about conducts adopted in cases of tooth avulsion (Table 2), 94.6% answered that replantation of the avulsed tooth is possible, and 76.6% said that it is possible to obtain success if the replantation is done 6 h or more after the accident.

Regarding mouthguard use (Table 3), 48.6% of the physicians did not know any type of them, and

Table 2- Knowledge of heads of club's health departments about the conducts to be adopted in case of dental injuries during the game (CI: confidence interval)

Question	Answer	Absolut Frequency	% (95%CI)
Do you know that is possible to replant an avulsed tooth?	1. Yes	35	94.6 (81.8-99.3)
	2. No	2	5.4 (0.7-18.2)
In your opinion, within which period of time a tooth must be replanted?	1. Up to 30 min	0	0.0 (0.0-9.5)
	2. Up to 1 h	3	8.3 (1.7-21.9)
	3. Up to 2 h	4	11.1 (3.0-25.4)
	4. Up to 6 h	7	19.4 (8.0-35.1)
	5. Up to 12 h	3	8.3 (1.7-21.9)
	6. Up to 24 h	8	21.1 (9.8-38.2)
	7. Don't know	10	27.8 (13.8-44.1)
Are you aware that immediate action is essential for a successful outcome?	1. Yes	34	97.1 (85.1-99.9)
	2. No	1	2.9 (0.1-14.9)
Do you know a dentist emergency service?	1. Yes	27	73.0 (55.9-86.2)
	2. No	10	27.0 (13.8-44.1)

Table 3- Knowledge about mouthguards of health departments' responsible (CI: confidence interval)

Question	Answer	Absolut Frequency	% (95% CI)
Do you know a mouthguard?	1. Yes	19	51.4 (34.4-68.1)
	2. No	18	48.6 (31.9-65.6)
If yes, which kind of mouthguard?	1. Stock	3	15.8 (4.2-33.7)
	2. "Boil and Bite"	11	57.9 (38.8-77.6)
	3. Custom-made	13	68.4 (46.0-83.4)
Do you recommend the wear of mouthguards by your team athletes?	1. Yes	8	21.6 (9.8-38.2)
	2. No	25	67.6 (50.2-82.0)
	3. Only for somebody	4	10.8 (3.0-25.4)
If not, why?	1. Communication	0	0.0 (0.0-12.8)
	2. Breathe	5	19.2 (6.3-38.1)
	3. Aesthetics	2	7.7 (0.9-24.3)
	4. Not necessary	13	50.0 (31.9-71.3)
	5. Others	7	26.9 (11.1-46.3)
The health department of your team has a dentistry department?	1. Yes	20	52.6 (35.8-69.0)
	2. No	18	47.4 (31.0-64.2)

67.6% had never recommended their use by the athletes. The lack of need was the most common reason (50%) for physicians not recommending mouthguard use. Of the interviewed teams, 52.6% have a dentistry department included in their medical departments.

DISCUSSION

Injuries are very common in sports, especially in those modalities involving more speed and close contact between athletes, which are more susceptible to facial and dental trauma¹⁴. Although soccer is not considered a dangerous activity⁴, 71.1% of the professional soccer team's physicians that took part in this study reported having observed dental injuries in soccer players during practice. This finding is in accordance with those of several authors that pointed soccer as a violent sport with high risk of injuries^{12,15,16,20}. However, in this study, the time of experience of the physicians in the medical departments was not asked and dental trauma occurrence could be overestimated. The most frequent kinds of dental trauma reported in this study were dental fractures (74.1%) and avulsions (59.3%), which are considered the most serious types of dental trauma⁷. Such finding could be due to the fact that most severe injuries are easily perceived, while less severe injuries, like concussions or enamel fractures, could be underestimated.

In the present study, the players more frequently affected by dental trauma were forwards (59.1%) and central defenders (44.4%). In a recent research, authors watched 10 matches of the Premier League (England) and closely analyzed 18,000 play actions, concluding that when the ball is close to the goal, on defensive or offensive areas, its possession is most vigorously contested, increasing the injury potential during the match¹⁶.

Despite the fact that the majority of the interviewees answered that they were aware of the possibility of replanting avulsed teeth, and the need for immediate action for successful prognosis, 76.6% of them either reported that an avulsed tooth can be replanted up to 6 h after the accident or did not know the answer. The International Association of Dental Traumatology recommends that replantation must be done at most after 1 hour of the accident, or the long-term prognosis is not favorable⁷. The fact that only 52.6% of the teams have a dentist in their medical department can justify the lack of information about this subject.

An appropriate treatment plan after injury is important for successful tooth replantation⁷, and the knowledge of emergency services plays an important role in this aspect. In this study, 73.0% of the physicians interviewed knew a dental

emergency service. Despite this, a considered number of Brazilian professional soccer teams (47.4%) do not have a dentistry department, hindering the exchange between health specialties. As a consequence, the majority of the physicians did not have adequate information about the emergency conducts after a dental avulsion. This fact becomes more important if we consider that the physicians are the professionals that assist the athletes in the stadiums during the matches.

The mandatory wear of mouthguards in various sports like American football, rugby and boxing, makes it possible the prevention of dental injuries^{14,17}. However, in soccer, mouthguard wear is not mandatory; consequently, the incidence of dental trauma is higher than other sports considered more violent, like martial arts¹⁰. These injuries can be prevented by protection of buccal region with mouthguards and by other strategies, like application of preventive programs in players focused in the adherence to the match rules and spirit of fair play⁸. Studies have demonstrated that most players do not have sufficient knowledge of prevention of dental injuries and mouthguards²². Forty-eight percent of the physicians in charge for medical departments in soccer teams in this study had no knowledge of mouthguards, and this could impair the possibilities of dental trauma prevention.

Only 21.6% of the physicians interviewed recommended the regular use of mouthguards for the players. This low rate could be attributed to the lack of information regarding to this protective device. In fact, the most frequently mentioned reason for not indicating mouthguards for the players was the belief that they are not necessary (50.0%). Other studies have mentioned difficult to communicate and breathe, and discomfort as the main reasons for athletes avoiding mouthguards use^{5,17}.

Different types of mouthguards are available and provide a sufficient level of protection to soccer players. Custom-made mouthguards are considered as the best option because they offer better protection with more comfort, without causing difficulties to breathe or talk during the match^{6,13}. The majority of health professionals that knew mouthguards in this study described the custom-made ones (68.4%). It is evident that a low proportion of Brazilian professional soccer players are wearing mouthguards during the matches and training activities. If this situation is present in the elite soccer, one can assume that a worse situation could be expected in the other minor leagues.

There is a long history of mouthguard use in sports. Mouthguards started being used in professional boxing in the early 1920's and become mandatory in American football in 1962, being currently requested in four sport modalities

in USA (ice hockey, lacrosse, field hockey and football). However, the American Dental Association recommends the use of mouthguards in 29 sports/exercise activities. Also, meta-analyses have demonstrated that the risk of an orofacial sports injury was 1.6-1.9 times higher when a mouthguard was not worn⁹.

To improve the situation observed in this study, the inclusion of a dentist as a member of medical departments of the Brazilian soccer professional teams should be mandatory, not only for prevention and treatment of dental injuries, but also for maintenance of players' oral health. In this context, Sports Dentistry¹⁷ emerges as a specialty to supply these and other future demands that appear in the universe of the professional elite soccer. Worldwide, Sports Dentistry has gained an increased interest and Brazilian dental professionals should be aware of this new area of clinical practice. Also, the Federations or Confederations responsible for sports practice regulation must understand that dentistry is an important part in the context of systemic health and different dental problems can impair the performance of professional players.

CONCLUSIONS

It can be concluded that dental injuries are common during Brazilian professional soccer practice and that there is a lack of information in the medical departments related to the emergency conducts and prevention of dental trauma. Strategies should be developed to improve the knowledge of teams' health professionals about the prevention and management of dental injuries. Other studies should be performed to stimulate the development of sports dentistry in Brazil.

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