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Sport dentistry: Brazilian athletes knowledge about dental trauma

Odontologia do esporte: conhecimento de atletas brasileiros sobre traumatismo dentário

Carolina dos Santos SANTINONI[a]*, Camila Caires DIAS[b], Letícia Vitória de Santana COTA[b], Yara Loyanne de Almeida Silva LEVI[c], Rosana Leal do PRADO[d], Juliane Avansini MARSICANO[b], Graziela Garrido MORI[e]

[a]UFSC – Universidade Federal de Santa Catarina, Departamento de Odontologia, Florianópolis, SC, Brasil
[b]UNOESTE – Universidade do Oeste de São Paulo, Faculdade de Odontologia, Presidente Prudente, SP, Brasil
[c]USP – Universidade de São Paulo, Faculdade de Odontologia de Ribeirão Preto, Ribeirão Preto, SP, Brasil
[d]UFMG – Universidade Federal de Minas Gerais, Departamento de Odontologia Social e Preventiva, Belo Horizonte, MG, Brasil
[e]UNOESTE – Universidade do Oeste de São Paulo, Faculdade de Medicina, Presidente Prudente, SP, Brasil

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Resumo

Introdução: Traumatismos dentários e faciais são lesões comuns relacionadas a esportes. **Objetivo:** O objetivo do presente estudo foi avaliar o conhecimento de atletas sobre prevenção e tratamento de traumatismo dentário. **Material e método:** Foi aplicado um questionário contendo questões sobre o tipo de esporte e duração, experiência prévia com traumatismos dentários, procedimentos para tratamento inicial e uso de protetores bucais. Os dados foram analisados estatisticamente (testes de Fisher ou Qui-quadrado). **Resultado:** Participaram 101 atletas. A maioria dos participantes pratica esporte há mais de 10 anos e 22% já sofreram traumatismos dentários. Cerca de 44% levariam o acidentado a um serviço de emergência/hospital e 41,58% o levariam ao Cirurgião Dentista. Cerca de 33% reimplantariam o dente avulsionado, 89,10% relataram a importância da limpeza dentária antes do reimplante, com apenas 23,76% lavando com água; o meio seco foi o mais adequado (36,63%) para manutenção do dente avulsionado, e apenas 5,94% usariam leite. Cerca de 35% dos atletas usam protetores bucais e 23,72% disseram não estar familiarizados com eles. O tempo de prática esportiva e a experiência prévia com traumatismos dentários não influenciaram o conhecimento, exceto para condutas relacionadas ao reimplante dentário e experiência prévia. **Conclusão:** Pode-se concluir que o conhecimento dos atletas brasileiros sobre traumatismo dentário é insuficiente e ações de orientação poderiam ajudar a salvar mais dentes.

Descritores: Avulsão dentária; traumatismo dentário; traumas em atletas.

Abstract

Introduction: Dental and facial traumatism are common sports-related injuries. **Objective:** Purpose of the present study was to evaluate knowledge of athletes about prevention and management dental trauma. **Material and method:** A questionnaire was applied, containing questions about the sport type and duration, previous experience with dental trauma, procedures for initial treatment, and mouthguards using. Data was statically analyzed (Fisher or Chi-square tests). **Result:** One hundred and one athletes participated. Most participants have been practicing sports for more than 10 years and 22% had already suffered dental trauma. Around 44% would take the injured person to an emergency service/hospital and 41.58% would take them to the Dentist. Around 33% percent would reimplant the avulsed tooth, 89.10% reported the importance of tooth cleaning before reimplantation, with only 23.76% washing with water; dry medium was the most suitable (36.63%) for maintaining avulsed tooth, and only 5.94% would use milk. Around 35% of athletes use mouthguards and 23.72% said they were not familiar with them. Time spent practicing sports and previous experience with dental trauma did not influence the knowledge, except for conduct related to dental reimplantation and previous experience. **Conclusion:** It can be concluded Brazilian athletes' knowledge about dental trauma is insufficient and guidance actions could help to save more teeth.

Descriptors: Tooth avulsion; dental trauma; trauma in athletes.

INTRODUCTION

Traumatic dental injuries account for a considerable proportion of bodily injuries and more than one billion living people have had this experience[1,2]. Dental and facial injuries are common sports-related injuries. It has been widely reported that participation in sports increases the risk of suffering dental trauma[3]. Epidemiology of maxillofacial trauma has been analyzed in countries around the world. Although its prevalence and incidence are generally high worldwide, they may vary considerably, it reflects not only socioeconomic, behavioral, and cultural diversity[2,4], but also the lack of standardized registration and classification systems observed in the literature[1,2,5]. Studies of facial injuries in emergency departments in Italy, Chile and Germany have identified that football has the highest frequency of sports-related facial fractures (41.6% - 59.2%). Compared to children, adolescents and young adults appear to be at greater risk of facial fractures. Although men are reportedly more likely than women to visit the emergency department for a sports-related facial fracture[6].

Sport Dentistry works with the prevention of oral and facial athletic injuries, diseases, and related oral manifestations. It has two main components: first is the treatment of orofacial injuries and the second is the prevention of sports-related orofacial injuries. Thus, Dentistry plays a key role in providing good oral care for athletes[3].

Main orofacial injuries consist of concussion, fracture, tooth dislocation and avulsion, soft tissue laceration, facial bone fractures and temporomandibular joint injuries[7]. Petrović et al.[8] showed that facial injuries are six times more likely to occur in sports than in work accidents and three times more likely than through exposure to violence or after traffic accidents.

Many sports-related traumatic dental injuries are preventable; the risk-benefit ratio can be improved using appropriate protective equipment[3]. Mouth guard is considered the primary device to minimize oral injuries suffered during sporting activities. Mouth guards were originally developed in 1890 by Woolf Krause, a London dentist, as a means of protecting boxers from lip lacerations. Such injuries were a common and often disabling accompaniment to boxing contests at that time[9]. Its mode of action basically consists of providing a resilient protective surface, to distribute and dissipate the forces transmitted upon impact. Measures to protect teeth can minimize the risk of trauma occurring in this region or minimize its severity[10].

Procedures at the scene of the accident can be performed by anyone, not just dental surgeons[11,12]. Therefore, consulting athletes about emergency procedures is important for the prognosis of dental trauma, especially tooth avulsion[13].

Purpose of the present study was to evaluate knowledge of Brazilian athletes about dental trauma prevention and management.

MATERIAL AND METHOD

The present study was approved by the Research Ethics Committee (CEP) of the University of Western São Paulo - Unoeste (Process #4526) and carried out with athletes from the city and region of Presidente Prudente (SP, Brazil). The athletes participated in the research only after a thorough explanation of their objectives by reading the letter of clarification to the patient and signing the free and informed consent form (FICF). This term included a description of how the athlete would be analyzed, guaranteeing the confidentiality of information, and disallowing any form of coercion or pressure for their voluntary participation.

Present study was based on the methodology published by Mori et al.[14] Inclusion criteria for the selection of participants included: athletes of both sexes, aged 18 or over, and who are registered as athletes at the Municipal Sports Secretariat of Presidente Prudente (SP, Brazil). After signing the FICF, the athletes received a specific questionnaire (Table 1), including questions about sports practice, experience with dental trauma, emergency procedures for dental trauma,

actions regarding tooth avulsion and about the use of mouthguards. Participants had up to 30 minutes to respond and, subsequently, the questionnaires will be collected by the researchers for qualitative and quantitative analyses.

Table 1. Questionnaire

1. Gender	( ) Male	( ) Female
2. Age (Years)	( ) 0 – 19 ( ) 41–60	( ) 20–40 ( ) > 61
3. Sport		
4. Time of practicing (Years)	( ) <1 ( ) 6-10	( ) 1–5 anos ( ) >11
5. Have you ever suffered any type of trauma to a tooth? (If yes, answer questions 6 to 8. If no, skip to question 9)	( ) Yes	( ) No
6. What type of injury did you have?	( ) Fractured part of the tooth ( ) The tooth was loose, but did not fall out of the mouth ( ) A fractured facial bone ( ) Other	( ) Fractured tooth root ( ) The tooth came completely out of the mouth ( ) Lip cut
7. How did you proceed?	( ) Did nothing about it ( ) Saw a dentist the next day ( ) Went to a university dental clinic	( ) Saw a dentist immediately ( ) Went to an emergency department or hospital ( ) Other
8. Did you have any after-effects?	( ) None () Tooth color change () Other	( ) I underwent dental work and that is all I did () Tooth had to be extracted
9. If you witnessed any case of dental trauma, what would you do?	( ) Take the person to the dentist immediately ( ) I would not know how to proceed ( ) I would look for a hospital	( ) Comfort the person and seek emergency services or a hospital ( ) I would look for a doctor ( ) Nothing
10. Do you have any experience with tooth avulsion? (When a tooth completely leaves its original location after trauma)	( ) Yes	( ) No
11. Did you or would you implant the tooth (put the tooth back in its original location) after tooth avulsion?	( ) Yes	( ) No
12. Do you think any cleaning procedures are necessary before reimplantation?	( ) Yes	( ) No
13. If yes, what would you do?	( ) I would wash the tooth with a toothbrush ( ) Put the tooth back in place	( ) I would wash the tooth with tap water ( ) I do not know
14. If you don't implant the tooth, how would you transport it to the dentist?	( ) Saline solution ( ) In hand ( ) Tap water ( ) Other	( ) Patient mouth ( ) On paper, plastic or cloth ( ) Milk
15. When you are playing sports, do you think you might lose a tooth?	( ) Yes	( ) No
16. Do you have knowledge about mouthguards for use during sports?	( ) Yes	( ) No
17. Do you use, or have you ever used a mouthguard?	( ) Yes	( ) No
18. If not, why?	( ) Difficulties during communication ( ) Aesthetics	( ) Difficulties during breathing ( ) Because I have never heard it

Percentages for each question were established. A correlation between the time spent practicing sports and previous experience and specific conduct for initial care was established using Fisher or Chi-square statistical tests. Level of significance was 5% ($p<0.05$).

RESULT

Most participants were male (81.19%) and aged between 20 and 40 years old (71.29%). More common practiced sports were volleyball (27.72%), football (24.75%) and kung fu (21.78%), with 30.69% and 42.57% of participants playing sports between one and five years old and more than 11 years, respectively.

Twenty-three participants (22.78%) have already suffered some type of dental trauma, with crown fractures (43.47%) and lip cuts (43.47%) being the most common occurrences. There were no reports of tooth avulsion occurring. Most victims sought care the day after the accident (34.78%) or did nothing (39.13%), with 65.21% reporting no sequelae in relation to the dental trauma.

Considering what they would do if they witnessed a case of dental trauma with another person, 41.58% would take the injured person immediately to the Dentist and 44.55% would comfort the injured person and seek an emergency service or hospital.

Regarding tooth avulsion, only two participants had experience with this type of dental trauma. When asked about behaviors related to that, 33.66% would undergo dental reimplantation, with the majority (89.10%) highlighting the need to clean the tooth before reimplantation but also that they would not know how to do it (35.64%). If they do not perform reimplantation at the scene of the accident, the majority would take the tooth to the dentist stored dry (36.63%) or in a container with saline solution (29.70%); milk would be the choice of 5.94% of participants.

When asked about the possibility of dental trauma, 55.44% reported that they believed this could occur. Regarding the use of mouthguards, 70.29% have knowledge about them when practicing sports and only 35.64% use them. Participants reported that difficulties during communication (27.11%) or breathing (20.33%) are the biggest problems for not using mouthguards.

The time spent practicing sports and previous experience with dental trauma did not influence the athletes' knowledge, except for conduct related to dental reimplantation and previous experience ($p < 0.05$).

Figures 1 and 2 shows results related to tooth avulsion management.

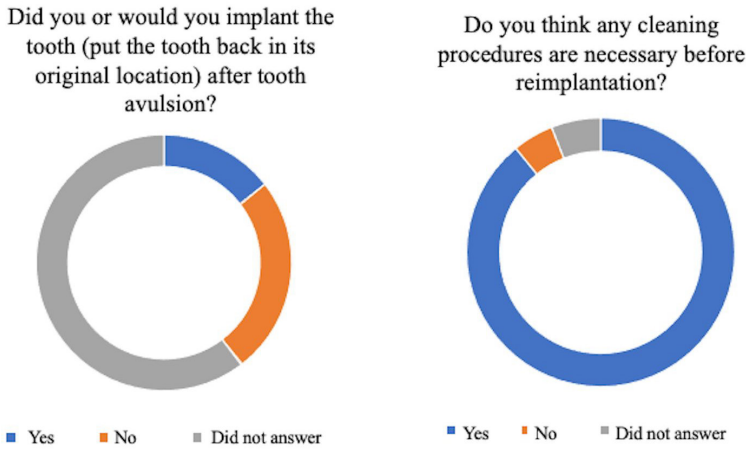

Figure 1. Results of questions about the possibility of reimplanting the tooth in case of avulsion and the need for prior cleaning.

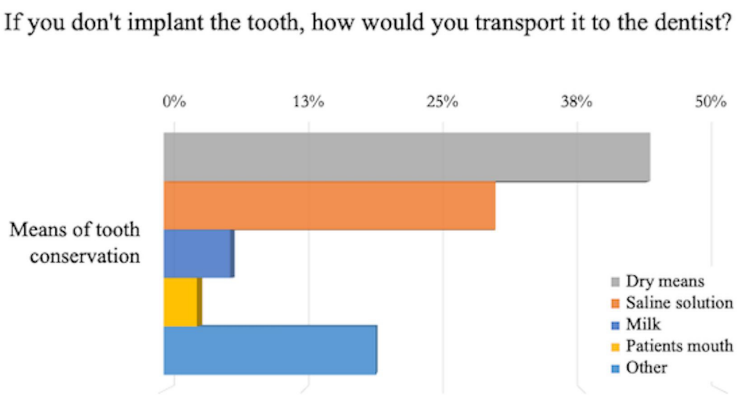

Figure 2. Results of the question about the chosen conservation method if the athlete chose to take the patient to the dentist.

DISCUSSION

Dental trauma can involve aesthetic, phonetic and emotional sequelae, or problems, representing an important public health problem[2,11,15,16]. Therefore, determining the knowledge of the populations involved with this problem is fundamental. It is known that sports practice can be one of the factors for the occurrence of dental trauma[11,15,16], therefore, it is necessary to ensure the athletes' behavior in relation to the occurrence of dental trauma during sports practice.

Present study evaluated the level of knowledge of athletes about dental trauma prevention and management, as well as previous experience and use of mouth guards as a form of prevention. Main sports reported here were volleyball, football, and kung fu. The types of sports in each country are influenced by the local culture[2]. Sports already correlated to the athletes' knowledge about dental trauma previously in different countries were football, handball, and roller skating at Germany[6], Karate and Taekwondo at Iran[17], cyclists and field hockey at Brazil[18], soccer and water polo at Croatia[19,20].

Our results demonstrated that in the studied population, experience with dental trauma was small and that the participants had never had contact with tooth avulsion even they were practicing contact sports with a higher occurrence of trauma. Contact sports, football, basketball, rugby, and hockey are those that most predispose people to dental trauma, when compared to other types of sports since the face is the target of the opponent through different techniques (kicks, punches, among others). Combined with the absence of mouth guards and the great exposure of the face, these sports lead to the occurrence of injuries in this region[11,12,15,21]. In this context, it is important to consider that there were only professional athletes registered at the Municipal Sports Secretariat of which may have helped to predict, avoid, and manage risk situations.

Regarding to their conduct if they testified a dental trauma situation, the athletes would immediately take the injured person to the dentist or the emergency department / hospital. This demonstrates that the population knows the importance of urgent care for the problem, which is essential for successful treatment[11,12,15,21]. However, when analyzing the conduct regarding tooth avulsion, it was found that knowledge regarding this trauma is reduced since the majority highlighted the need to clean the tooth before reimplantation but also that they would not know how to do it and would take the tooth to the dentist stored dry. These results corroborate previous studies[13,14,22,23] and evidence need of guidance campaigns on conduct relating to emergency care for tooth avulsion with the aim of reducing tooth loss because of dental trauma. This hypothesis is confirmed by Azizzadeh et al.[17] that did show positive impact of educational interventions on the knowledge of prevention and emergency management of traumatic dental injuries in athletes.

Management of dental avulsion require some specific knowledge. Our and previous results did show that athletes have not enough knowledge about the issue[17-20]. If a tooth is avulsed, make

sure it is a permanent tooth (primary teeth should not be reimplanted). It is necessary to keep the patient calm. When finding the tooth, it must be held by the dental crown, avoiding root manipulation. If the tooth is dirty, it should be washed briefly for a maximum of 10 seconds under running water. Soon after, the tooth must be reimplanted, repositioning it back into its original socket. Once the tooth is repositioned, bite down on a tissue to keep it in position and see a dental surgeon[24]. When reimplantation of the avulsed tooth is not possible, the tooth should be placed in a glass of milk or other storage medium. appropriate and seek a dental surgeon as quickly as possible[24]. In this way, it can be inferred that the prognosis of an avulsed tooth depends on the time spent extra orally and the storage conditions of the element, until the moment of reimplantation[11,12,15,21]. It is also important considering time of reimplantation. It must be carried out within a maximum of 15 minutes from the moment the tooth was avulsed since after this time the cells lose their viability[25]. If it is not possible to carry out reimplantation within this time, the way in which the avulsed tooth is stored determines the treatment prognosis[13]. The means of conservation or storage must maintain the vitality of the periodontal ligament cells, favoring the repair of the periodontal ligament and reducing the risk of dental ankylosis[25] and root reabsorption and consequent tooth loss[24]. Some accessible media in which the dental element can be stored are milk, saline or filtered water, with milk being the media of choice. Thus, after washing in running water, the tooth is immersed in the conservation medium[11,12,15,21,24].

Sequelae resulting from dental trauma include color change, mobility, pulp necrosis, bone and tooth resorptions[10] and can be prevented through adequate and immediate treatment, in which the dental surgeon plays a fundamental role[13]. In this context, knowing that it is important to direct these patients to the dentist is extremely important. Our results demonstrated satisfactory knowledge in this item. Prognosis of dental injuries depends on some factors that must be observed at the time of the dental trauma, such as the type of injury that occurred, the way in which this dental element is treated and the time between the trauma and care[24]. Among the types of dental trauma that can occur during sports, the literature shows that tooth avulsion and crown fracture are the most affected[26]. In these cases, time is a component of great importance in the prognosis, especially in cases of tooth avulsion, this is one of the most severe dental injuries[26].

Finally, prevention is a key component when it comes to the occurrence of trauma and maintaining the quality of health. In addition to information campaigns on patient management, disseminating the possibility of using mouthguards should also be considered. Present study did show 70.29% have knowledge about them when practicing sports and only 35.64% use them. Neglect in the use of protectors despite the knowledge of their importance corroborates previous studies. Kasum et al.[20] reported although most respondents (93.9%) were familiar with mouthguards and 68.9% believed that they help prevent injuries while playing football, only 16% used them. Tadin & Buzov[19] awareness of mouthguards was high (93.9%), whereas their actual use was low (7.0%) because 35.1% of respondents reported discomfort wearing them. Here, participants also reported that difficulties during communication (27.11%) or breathing (20.33%) are the biggest problems for not using mouthguards. Other reasons reported in the literature for low use of mouthguards were having braces, being expensive, being annoying and lack of knowledge about where to get it[17]. In this context, it is important to consider there are different types of mouthguards: stock, semi customized, and customized[3,7,27]. Stock mouthguards are commercialized and used without modification[7]. Semi customized are composed of a thermoplastic copolymer, the boil and bite thermoplastic mouthguard is manufactured by placing the mouthguard in boiling water to plasticize the material[3,7]. The material is then placed in the athletes' mouth, where it is molded with finger pressure as well as facial and intraoral muscle movements to improve adaptation to the soft and hard tissue structures of the mouth[28] (commercial and self-made). Last one is customized (made by a dentist and/or dental technician using a model of the patient's teeth)[27]. Light-cured urethane diacrylate also it is used today for protection and better comfort and protection[3].

It can be concluded Brazilian athletes' knowledge about dental trauma is insufficient and guidance actions could help to save more teeth.

AUTHORS' CONTRIBUTIONS

Carolina dos Santos Santinoni: Project development, data collection and analyses, interpretation of results, manuscript writing and submission. Camila Caires Dias and Letícia Vitória de Santana Cota: Data collection and analyses. Yara Loyanne de Almeida Silva Levi: Data collection and analyses, interpretation of results. Rosana Leal do Prado and Juliane Avansini Marsicano: Statistical analyses and interpretation of results. Graziela Garrido Mori: Project development and supervision, data analysis, interpretation of results and manuscript writing.

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CONFLICTS OF INTERESTS

The authors declare there are no conflicts of interest.

*CORRESPONDING AUTHOR

Carolina dos Santos Santinoni, UFSC – Universidade Federal de Santa Catarina, Departamento de Odontologia, Florianópolis - SC, Brasil, e-mail: carolsantinoni@msn.com

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