Volume 19 Issue 40
Originally issued as J5



Global Journal of Medical Research: J
Dentistry & Otolaryngology
Volume 19 Issue 5 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Mouthguard and Orofacial Traumatismo in Young Roller Hockey Practicers

By Lopes, L & Santos, M

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Materials and Methods: An observational cross-sectional study based on clinical observation and questionnaire application to the athletes under search. The sample consisted of 117 roller hockey athletes between 13 and 19 years old, in Portugal, in several clubs which were, Sporting Clube de Portugal, Sport Lisboa e Benfica, Clube Desportivo de Paço de Arcos and Parede Futebol Clube.

Results: The prevalence of mouthguard used was 16.2%, and 56.2% of them used Type II, and 47.4% Type III.

The prevalence of orofacial trauma was 38.5%, in which 71.1% of these dental injuries involved the upper incisors, which were the most affected teeth, both the deciduous and definitive dentition.

At the time of injury, only four athletes wore mouthguards, which 1 type I, 2 of type II and 1 of model III.

Conclusion: Roller hockey is a sport in which the prevalence of mouthguard use is low, and that of orofacial trauma is high. Thus, the mouthguard is a device that should be more used by athletes, since it is useful in preventing these injuries.

Keywords: *sports, roller hockey, mouthguard, orofacial injuries.*

GJMR-J Classification: *NLMC Code: WU 290*



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I. Introduction

The cause of traumatic dental injuries are usually the result of an external impact on a tooth and its surrounding tissues.(Soares et al., 2016) Dental trauma is thus a public health problem that affects a large number of people, leading in certain cases to irreversible tooth loss, not only during the accident but also during or after treatment. In athletes, trauma often occurs in youth and contact sports, representing an important group in the etiology of dental trauma. (Ferrari & Medeiros, 2002)

Contact sports are those in which practitioners are in direct physical contact with other players or objects, which leads to a higher likelihood of trauma and injury. (Fernandes et al., 2019)

Despite efforts to reduce the number of dental injuries, the incidence is relatively high in children and young people. (Sigurdsson, A., 2013) Mouthguards are a viable option for the prevention of traumatic injuries of the oral cavity during sports practice, and their use is more relevant in contact sports, despite their low frequency. (Collins et al., 2016)

The practitioners of Hockey should use mouthguards to prevent the occurrence of oral trauma, since Hockey is a high-risk collective sport in which physical contact is marked (Galic et al., 2018)

Understand the importance of use the mouthguard by young people who practice a collective contact sport and its relationship with the orofacial trauma suffered by them is the aim of this study.

II. Materials and Methods

This is an observational cross-sectional study with a sample of 117 athletes between 13 and 19 years old practicing a collective contact sport.

It was conducted a study at the Sporting Clube de Portugal, Sport Lisboa e Benfica, Clube Desportivo de Paço de Arcos e Parede Futebol Clube, in their respective sports halls.

Observation and personal and direct interview with the athletes and father/mother/legal guardian were used to collect the following data: gender; age; occurrence of orofacial trauma; circumstances of the fact of orofacial lesion (outside sports, during sports or both); injury location (dental and/or soft tissue); in case of dental trauma, what type of wound occurred in concrete; if a dentist was report after the harm occurred; if you went to a dentist, how long did it take to do so; in case of avulsion of a tooth, is it aware of the possibility of its reimplantation and, if so, how long do you think is proper to do that intervention; and in which transport medium do you think is suitable for; what kind of impact caused the trauma; if it was during sports practice, was mouthguard used at the time of injury; if you used a mouthguard at the time of injury, what type did you use; type of occlusion; presence of risk factors (increased overjet and high caries index); knowledge about what is and what is the function of a mouthguard; frequency of mouthguard use; type of mouthguard; frequency of mouthguard replacement; existence in the club concerned of any advice regarding the use of mouthguards; opinion regarding the relevance of the mouthguard; what are the reasons for not using it.

The observation was made with the individual sitting, facing the observer, with the parent/legal guardian next to him/her and in the place/sports hall/room where the training took place, with the aid of

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artificial light. Occlusion and risk factors were evaluated, as well as the presence of traumatic injuries and orthodontic appliances not previously mentioned by the guardians, as well as the DMFT index.

Descriptive statistics were performed for the final sample (absolute and relative frequencies), analyzing universal and independent variables. The binomial test was used to compare two proportions.

The data collected were statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0 software program for Windows and synthesized in figures in the Microsoft Office Excel 2019 software program.

III. Results

For this research, we considered a final sample of 117 young people between 13- and 19-years old roller hockey practitioners, who're mean, and mode age was 15.3 years and 13 years, respectively. Regarding gender, only 0,9% (n=1) was female. As for sports clubs, 23,1% (n=27) were athletes from Sporting Clube de Portugal, 22,2% (n=26) from Sport Lisboa e Benfica, 32,5% (n=38) from Clube Desportivo de Paço de Arcos and 22,2% (n=26) of Parede Futebol Clube.

Overall, 38,5% (n=45) of the athletes suffered orofacial trauma at least once (Figure 1), which specifically affected the teeth in 71,1% (n=32) of the cases (Figure 2).

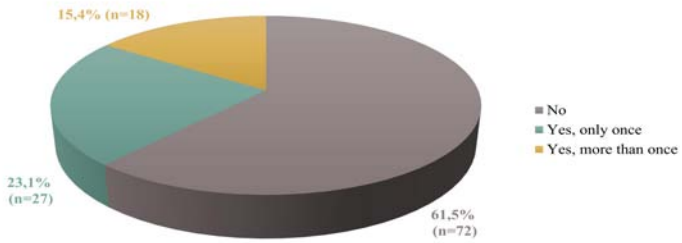


Figure 1: Sample distribution regarding the occurrence of orofacial trauma

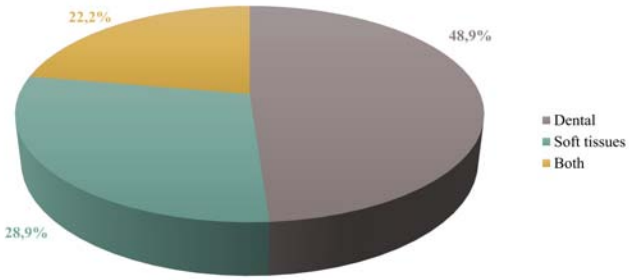


Figure 2: Distribution of the orofacial trauma sample by location

Of these, 68,8% (n=22), the affected dentition was the definitive one (most often the definitive maxillary incisors), 25% (n=8) affected the deciduous dentition (most often the deciduous maxillary incisors) and 6,3% (n=2) both dentitions.

Regarding the type of injuries suffered, 62,5% (n=20) of them were coronary fractures, 9,4% (n=3) subluxations, 6,3% (n=2) intrusions, 12,5% (n=4) avulsions and 9,4% (n=3) of another type unknown.

It was observed, regarding the type of impact that led to trauma, that 71,9% (n=23) occurred due to impact with some equipment and 28,1% (n=9) due to impact with another athlete (Figure 3).

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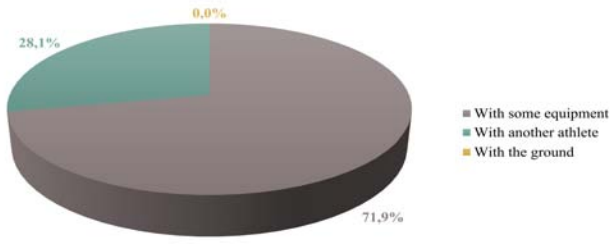


Figure 3: Distribution of the sample that suffered orofacial trauma during sports related to the type of impact

Facing the knowledge about the function of the mouthguard, 90,6% (n=106) of the athletes reported knowing their role, and 9,4% (n=11) reported not knowing his paper (Figure 4).

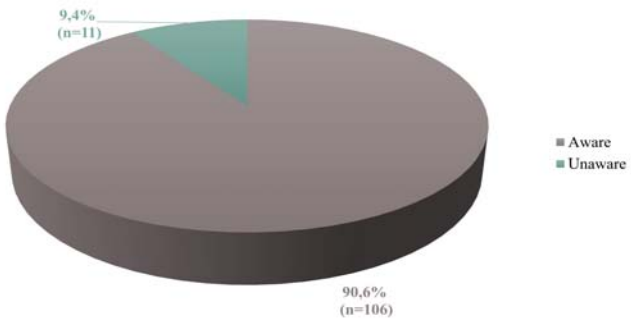


Figure 4: Total sample distribution regarding knowledge of mouthguard function

Considering the counseling on the use a mouthguard in the respective sports club, 90,6% (n=106) reported no recommendation, 6,0% (n=7) related that it exists and 3,4% (n=4) describes not knowing/not responding.

The opinion about the use of a mouthguard is variable, 60,7% (n=71) indicated that it could be used, but it is their choice, 37,6% (n=44) that should be used and 1,7% (n=2) indicated not knowing/not answering (Figure 5).

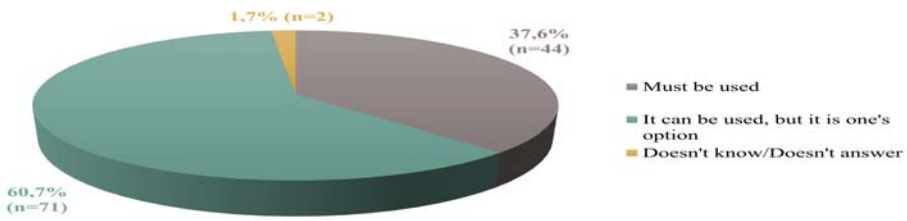


Figure 5: Sample distribution regarding opinion about the use of a mouthguard

Of all athletes, only 16,2% (n=19) used mouthguard, 52,6% (n=10) Type II and 47,4% (n=9) Type III (Figure 6 and Figure 7).

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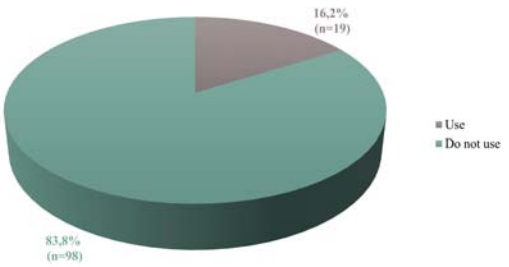


Figure 6: Total sample distribution regarding the use of a mouthguard

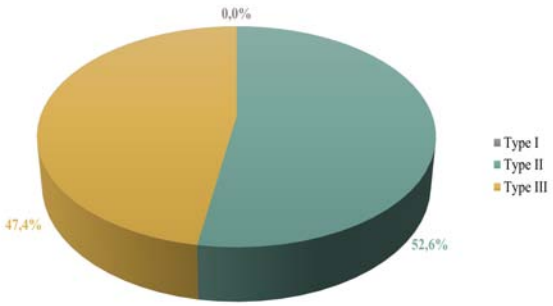


Figure 7: Distribution of the sample that uses a mouthguard about to the type used

Of these, 10,5% (n=2) of the individuals had orofacial trauma in the past but already used mouthguard, and 21,1% (n=4) of the individuals had orofacial injury in the past, but not since they started using mouthguard (Figure 8).

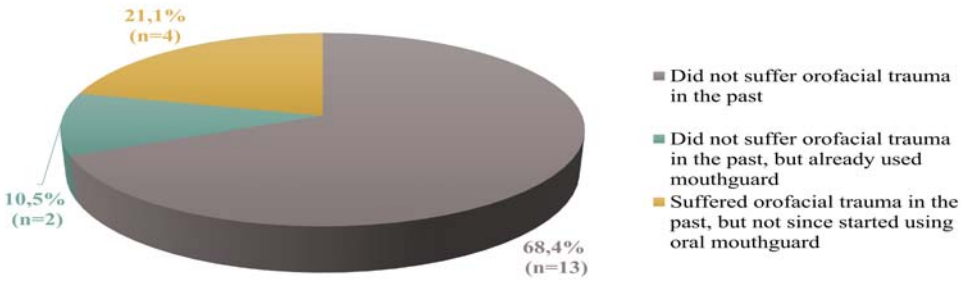


Figure 8: Distribution of the sample that currently uses mouthguard regarding the occurrence of orofacial trauma during sports practice in the past

At the time of the injury, only four athletes used a mouthguard, which 25% (n=1) used Type I, 50% (n=2) Type II and 25% (n=1) Type III (Figure 9 and Figure 10)

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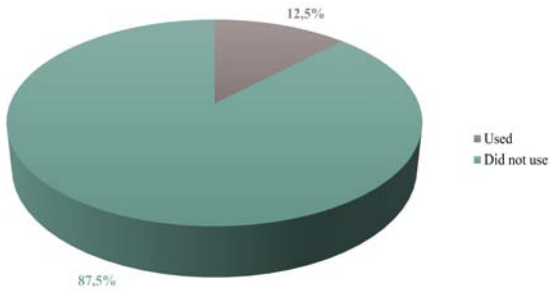


Figure 9: Distribution of the sample that suffered orofacial trauma during sports practice regarding the use of a mouthguard

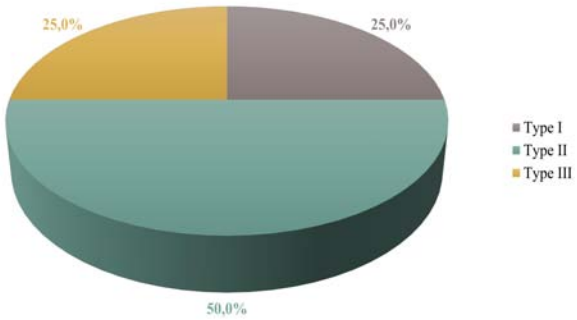


Figure 10: Distribution of the sample that used mouthguard during orofacial trauma about the type of a mouthguard used

Regarding the 52,6% (n=10) of individuals currently using Type II mouthguard, 31,6% (n=6) had no orofacial lesion in the past, 5,3% (n=1) had orofacial wound in the past, but already used mouthguard at the time and 15,8% (n=3) suffered orofacial trauma in the past, but has not suffered any more injurysince they began using mouthguard.

Relatively to the 47,3% (n=9) of individuals currently using Type III mouthguard, 36,8% (n=7) had no orofacial trauma in the past, 5,3% (n=1) had damage in the past, but already used mouthguard and 5,3% (n=1) suffered orofacial harm in the past, but not since they began using oral mouthguard.

IV. Discussion

Regarding the athletes' knowledge about the mouthguard, in the study sample, it was concluded that 106 athletes (90,6%) knew the mouthguard and its function. In Portugal, the values range between 41,8% and 100%, similar to those in other countries where the values range between 51,6% and 97,3%.(Antunes et al., 2016; Collins et al., 2016; Galic et al., 2018; Goswami et al., 2017; Lopes, 2014; Matos, 2011; Pacheco, 2012; Sethi et al., 2016; Tiwari et al., 2014)

Thus, it was essential to understand the prevalence of mouthguard use. It was found in the sample of 117 young roller hockey practitioners under study, that 19 (16,2%) used a mouthguard in their sports practice. Of these 19, 10 (52,6%) used Type II mouthguard, and 9 (47,4%) used Type III mouthguard. There are several studies on this subject, both national and foreign. In Portugal, the values range between 0,8% and 18%, and abroad the values range between 4,25% and 91,3%. However, differences between studies should be taken in consideration because of the different age groups and modalities.(Al-arfaj et al., 2016; Antunes et al., 2016; Çaglar et al., 2005; Collins et al., 2015; Ferrari & Ferreira De Medeiros, 2002; Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Hersberger et al., 2012; Kroon et al., 2016; Lahti et al., 2002; Lieger & Von Arx, 2006; Lopes, 2014; Matos, 2011; Pacheco, 2012; Sethi et al., 2016; Silva, 2013; Tiwari et al., 2014; Vucic, Drost, Wijk et al., 2016)

It was also recorded the prevalence of orofacial injuries. In the study sample of 117 athletes, 45 of them (38,5%) reported having suffered orofacial trauma at least once, and 18 of them (15,4%) suffered trauma for more than once. Of the 45 (38,5%), 32 (71,1%) suffered

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a dental trauma, 4 of them (12,5%) reported using a mouthguard during the incident, 1 of which Type I (25%), 2 Type II (50%) and 1 Type III (25%). In Portugal, the values range between 3,9% and 90%, while abroad, the oscillation between 10,7% and 57,9% is smaller. (Al-arfaj et al., 2016; Çaglar et al., 2005; Collins et al., 2016; Ferrari & Ferreira De Medeiros, 2002; Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Hersberger et al., 2012; Juneja et al., 2018; Kroon et al., 2016; Lieger & Von Arx, 2006; Lopes, 2014; Martins et al., 2013; Matos, 2011; Pacheco, 2012; Rattai & Levin, 2018; Silva, 2013; Tiwari et al., 2014; Traebert et al., 2004; Vucic et al., 2016; Zamora-Olave et al., 2018)

It was also under analysis which type of dental injury was the most prevalent, verifying that it was the dental fracture, because of the 32 athletes who suffered a dental trauma, 20 (62,5%) suffered a coronary fracture. In similar studies conducted both in Portugal and abroad, the results were in line with ours with dental fracture as the most prevalent dental injury. (Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Lopes, 2014; Rozi et al., 2017; Santos, 2013; Spinas, Mameli, & Giannetti, 2018)

Regarding the type of tooth most affected, it was found that the maxillary incisors were the most injured tooth type in both dentitions, both deciduous with seven individuals (6%) reporting trauma to these teeth, and the definitive one in which 18 individuals (15,4%) stated the same. In studies carried out in Portugal, the results were identical to ours, with the upper incisors being the target of trauma more frequently, as in outside studies. (Juneja et al., 2018; Lahti et al., 2002; Martins et al., 2013; Rozi et al., 2017; Santos, 2013; Spinas et al., 2018)

It was found several kinds of impacts during sports that may be responsible for orofacial trauma, of the 32 of injuries sustained during sports, 23 (71,9%) occurred due to impact with some equipment, and 9 (28,1%) due to impact with another athlete, with no injury due to impact with the ground. As for other studies conducted abroad the results vary: (Lahti et al., 2002) reported that 48,9% of athletes suffered impact-related orofacial trauma with sports equipment, specifically with the stick, (Collins et al., 2016) reported that 61,3% of dental injuries were due to contact with another athlete, 31,5% to impact with some equipment, 4,1% to impact with the playing surface and 3,2% for another or unknown and (Vucic et al., 2016) reported that the main cause of orofacial trauma was impacted with the ball (57%), followed by impact with the stick (39%)

One of the objectives of this study was to verify whether there is a correlation between increased overjet and orofacial trauma. We then observed that of the 32 athletes who suffered a dental trauma, 6 (18,7%) had an overjet greater than 3mm, unlike the remaining 26 (81,3%) who had an overjet less than 3mm. Comparing with similar studies, the results obtained were quite different. We have (Traebert et al., 2004) who reported that children with overjet larger than 5mm suffered more dental trauma (15,3%) than children with overjet up to 5mm (9,9%), (Martins et al., 2013) who mentioned that the prevalence of overjet children over 3mm was 21,6%, not being statistically significant in relation to dental trauma and also (Juneja et al., 2018) who found that among children with overjet than 3mm 13,4% suffered traumatic dental injury. Among children with an overjet smaller than 3mm, 9,6% suffered traumatic dental injury.

Finally, our main objective was to understand if the mouthguard use decreased the prevalence of orofacial trauma. Orofacial injuries occurred to only four athletes using mouthguard, which 2 (6,3%) only once, and 2 (6,3%) more than once. So, the distribution was as follows: 1 athlete (25,0%) used Type I, 2 (50,0%) used Type II, and 1 (25,0%) used Type III mouthguard. We also observed that of the 19 athletes currently using mouthguard, 6 (31,6%) had already suffered orofacial trauma during past roller hockey practice, and 2 (10,5%) had orofacial trauma in the past, but already used mouthguard and 4 (21,1%) suffered orofacial trauma in the past, but not since they began using mouthguard. Thus, the remaining 13 (68,4%) had never suffered orofacial trauma in the past. Regarding the type of mouthguard currently used by these 19 athletes, there was the following distribution: 10 athletes currently use Type II mouthguard, and 6 (31,6%) did not suffer orofacial trauma in the past, 1 (5,3%) had orofacial trauma in the past, but already used mouthguard and 3 (15,8%) had orofacial trauma in the past, but not since they started using mouthguard. Regarding the Type III mouthguard, 9 athletes currently use it, and 7 (36,8%) did not suffer orofacial trauma in the past, 1 (5,3%) had orofacial trauma in the past, but already used mouthguard and 1 (5,3%) has suffered orofacial trauma in the past, but not since they started using mouthguard. In Portugal, Silva (2013) concluded mouthguard would be effective. In studies abroad, (Lieger & Von Arx, 2006) and (Tiwari et al., 2014) had satisfactory results relatively the reduction of trauma by the mouthguard, unlike (Kroon et al., 2016) who found that 135 athletes used mouthguard at the time of injury and 131 did not, thus registering a higher occurrence of injuries among athletes using mouthguard.

V. Conclusion

The mouthguard should be increasingly used by all roller hockey athletes, and they must be sensitized and advised to use it to avoid orofacial injuries and whose consequences may be manifestly negative.

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