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Rugby athletes' awareness and compliance in the use of mouthguards in the North West of Italy

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Correspondence to: Dr Paolo Boffano, Maxillofacial Surgery Unit, Head and Neck Department, San Giovanni Battista Hospital, University of Turin, Corso Dogliotti 14, 10126, Torino, Italy Tel.: +39 011 6335125 Fax: +39 011 6335125 e-mail: paolo.boffano@gmail.com Accepted 9 September, 2011 Abstract - Background: The prevention of dental injuries during full-contact sports such as rugby is extremely important. Wearing a mouthguard can significantly reduce the frequency and severity of orofacial injuries, but it is not always used as athletes find it difficult to tolerate. The purpose of the present study was to determine the awareness and the extent of mouthguard use in a sample of young rugby athletes in the North West of Italy. Material and Methods: The athletes of four amateurs rugby teams based in the Province of Turin, Italy completed a questionnaire about playing history, current use and type of mouthguards, disturbs associated with mouthguard use, and general attitudes towards mouthguards. Results: Only 53.85% of the subjects reported wearing their mouthguard all the time both during training and games. The most commonly reported problem associated with using a mouthguard was the discomfort on speech, followed by difficulty in closing lips, adversely affected breathing, adversely affected swallowing and slipping sensation. A statistically significant association between patients < 22 years and non-use of mouthguards was observed. Conclusion: Limited knowledge about oral injury prevention and limited use of mouthguards were observed. The present study suggests that educational courses for rugby players and coaches to promote the use of mouthguards would be extremely important to reduce common complaints about these devices and increase their usage.

Dental injuries are probably the most common orofacial injuries sustained during sports activities (1), in particular, following full-contact aggressive sports such as rugby (2–6).

Traumatic injuries to the dentition can rise to functional, aesthetic and psychological long-term problems (often with high follow-up costs) (3, 7–11). Therefore, the prevention of such injuries is extremely important. Several authors showed that wearing a mouthguard can significantly reduce the frequency and severity of orofacial injuries in sports (3, 7, 12–14).

In fact, the mouthguard is a resilient device placed in the mouth to prevent and reduce possible oral injuries, in particular of the teeth and surrounding structures (7, 15). The mouthguard acts on absorbing, distributing and dissipating the transmitted forces in the impact zone (7, 8, 16). Therefore, mouthguards can: prevent oral soft tissue from lacerations against the teeth, lessen the risk of injury to anterior teeth following a frontal blow, decrease the risk of damage to posterior teeth of either jaw, and lessen the risk of mandibular fractures and concussion by separating the jaws (2, 7, 11, 15, 17– 19).

Nevertheless, many athletes do not wear them during training and competition, as they find them difficult to tolerate (14, 16). The main reasons for not wearing these

appliances are discomfort and difficulty in breathing and speaking (7, 11). Finally, attitudes of coaches and parents toward wearing mouthguards influence their usage (2).

Therefore, the purpose of the present study was to determine the awareness and the extent of mouthguard use in a sample of young rugby athletes in the North West of Italy.

Materials and methods

The athletes of four amateurs rugby teams of different ranges of age based in the Province of Turin, Italy were enrolled for this study. Athletes who agreed to participate in the study completed a questionnaire on their own. Questionnaires identified the following information from participants: age, date of birth, sex, playing history, current use and type of mouthguards, disturbs associated with mouthguard use and general attitudes towards mouthguards (Table 1).

Statistical analysis was used to search for associations between years playing rugby and current use of mouthguards, and between age and current use of mouthguards. Statistical significance was determined using the X2 or Fisher exact test if the sample sizes were too small.

Tal	ble	1.	Ath	letes'	qu	estioni	naire

1. Name
2. Surname
3. Date of birth
4. Age
5. Sex
6. Playing history (years)
7. Do you wear a mouthguard?
□ Yes
□ No
8. If yes, which type of mouthguard
do you own?
Stock
Boil – and – bite
Custom made
9. When do you wear your mouthguard?
\Box During matches and training
During matches
Never
10. Do you have any complaints while
using a mouthguard? What kind of?
Speech Speech
□ Breathing
Dry mouth
Bad taste and odor
□ Other

Results

Sixty-five completed questionnaires were returned with a response rate of 84%. All the athletes were men. The age distribution of the respondents is given in Fig. 1: about 43% of the subjects were aged 20–24. The mean age of the surveyed population was 22.15 years (range, 13–39 years; median, 21; SD, 5.66), and these players had an average playing history of 6.14 years (range, 1–23 years; median, 5; SD, 4.95).

Table 2 presents the descriptive results of self-reported players' use of mouthguards. Only 53.85% (35) of the subjects reported wearing their mouthguard all the time both during training and games. Instead, 32.3% of the athletes reported that they never used mouthguards: among these, 11 subjects never tried to wear a mouthguard, whereas 10 players found it uncomfortable and did not use it any more.

Of those who reported prior or current mouthguard use (54 subjects), the type of mouthguard reported was as follows: stock, 17/54 (31.5%); boil-and-bite, 27/54 (50%); custom 10/54 (18.5%).



Fig. 1. Age distribution of the study population.

Table 2. Self-reported mouthguard wearing rates in rugby players of the study population

Mouthguards use	Number of players	Per cent of players (%)	
Never	21	32.3	
Games only	9	13.85	
Games and training	35	53.85	
Total	65	100	

Among these 54 athletes, the most commonly reported problem associated with using a mouthguard was the discomfort on speech with 79.6% (43 subjects), followed by difficulty in closing lips, adversely affected breathing, adversely affected swallowing and slipping sensation (Table 3). All the athletes who did not use this protective equipment any more had reported at least three of these problems: they all had used stock or boil-and-bite devices.

There was no correlation between the years playing rugby and the current use of mouthguards. [relative risk (RR), 1.22; 95% confidence interval (CI), 0.38–3.99; P = 0.9].

Instead, a statistically significant association between patients < 22 years and non-use of mouthguards (RR, 3.5; 95% CI, 1.16–11.4; P < 0.05) was observed.

Discussion

Traumatic dental injuries may determine functional, aesthetic and psychological lifelong problems and consequent considerable follow-up costs (3). Previous studies demonstrated that sports-related dental trauma ranges from 8% to 45% (13, 20-25), highlighting the importance of preventive measures such as wearing mouthguards that were proved to decrease the number and severity of orofacial injuries significantly (2, 26, 27). Mouthguards are effective because they decrease the deflection of teeth subjected to stress in comparison with unprotected teeth by absorbing and dissipating high impact energy, which otherwise would be transferred directly to the underlying dentition (8, 28-31). Nevertheless, in our study, only 53.85% of the subjects reported wearing their mouthguard all the time both during training and games. Discomfort appeared to be an important reason for the non-use of this protective equipment. In fact, athletes' satisfaction with mouthguards is of great importance, because an athlete's

Table 3. Problems associated with using mouthguards among the 54 athletes who reported prior or current use of mouthguards

Type of the problem	Number of athletes (%)
Speech	43 (79.6)
Closing lips	12 (22.2)
Breathing	9 (16.7)
Swallowing	9 (16.7)
Slipping	7 (12.9)
Some athletes stated multiple problems	

attitude toward wearing a mouthguard seems to be influenced at least in part by comfort and ability to speak and breath (14, 17). In our study population, all the athletes who did not use this device any more reported various (at least three) problems associated with using a mouthguard.

Theoretically, a properly fitted mouthguard should be protective, comfortable, resilient, odourless, tear-resistent, tasteless, easy to fabricate and should not interfere with speech (28).

There are different types of mouthguards that most likely influence the athlete compliance with mouthguard use (27). In particular, mouthguards have been classified into three main categories: stock mouthguards, 'boiland-bite' mouthguards and custom-made mouthguards. Most athletes, as in our study population, tend to choose boil-and-bite or stock devices because they are less expensive, but they often reveal to be loose and cumbersome. Conversely, custom-made mouthguards are made using an impression of the individual's teeth to fit the individual according to specifications provided by a dental professional (16), thus showing optimal comfort and wearability (with superior speech and respiration) and giving better protection (11, 16). Furthermore, custom-made devices last longer than other types (12).

Athletes often are hesitant to wear mouthguards with regularity during both training and games (8). However, all interviewed athletes who used custom-made mouthguards did not give up using them throughout the year, as they referred fewer discomfort problems in comparison with other mouthguards. Therefore, the type of mouthguards seems to be crucial for the regularity of their use. Players, coaches and parents do not seem to have enough information regarding the benefits of wearing mouthguards, thus the underuse of these devices is at least partially attributable to the lack of education provided to athletes (8, 26). Despite the availability of mouthguards and their role in reducing oral injuries, the key factor is inadequate information regarding the risk of injury and the long-term benefits of using a mouthguard (8). We believe that a special educational programme emphasizing the importance of mouthguard use, as well as first aid measures for dental trauma, is vital to promote awareness, knowledge and motivation among rugby players and coaches; emergency education provided by physicians should be a part of rugby training. It is important to notice that in our study, statistical analysis found significant associations between patients < 22 years and non-use of mouthguards. Ideally, when a youngster starts to practicing rugby, he should be encouraged to wear mouthguards, so that he would automatically consider it as a part of the game. Therefore, a great responsibility lies on coaches in checking the players' sports activities.

Limited knowledge about oral injury prevention and limited use of mouthguards were observed. The present study suggests that educational courses for rugby players and coaches to promote the use of properly fitted, specifically custom-made mouthguards would be extremely important and beneficial, to reduce common complaints about these devices and increase their usage.

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