Dental Traumatology 2005; 21: 127–130

DENTAL TRAUMATOLOGY

Oro-facial injuries in Central American and Caribbean sports games: a 20-year experience

Amy E. Oro-facial injuries in Central American and Caribbean sports games: a 20 year experience. Dent Traumatol 2005; 21: 127–130. © Blackwell Munksgaard, 2005.

Abstract – Dental services in sports competitions in the Games sponsored by the International Olympic Committee are mandatory. In every Central American, Pan American and Olympic Summer Games, as well as Winter Games, the Organizing Committee has to take all the necessary measures to assure dental services to all competitors. In all Olympic villages, as part of the medical services, a dental clinic is set up to treat any dental emergency that may arise during the Games. Almost every participating country in the Games has its own medical team and some may include a dentist. The major responsibilities of the team dentist as a member of the national sports delegation include: (i) education of the sports delegation about different oral and dental diseases and the illustration of possible problems that athletes or other personnel may encounter during the Games, (ii) adequate training and management of orofacial trauma during the competition, (iii) knowledge about the rules and regulations of the specific sport that the dentist is working, (iv) understanding of the anti-doping control regulations and procedures, (v) necessary skills to fabricate a custom-made and properly fitted mouthguard to all participants in contact or collision sports of the delegation. This study illustrates the dental services and occurrence of orofacial injury at the Central American and Caribbean Sports Games of the Puerto Rican Delegation for the past 20 years. A total of 2107 participants made up the six different delegations at these Games. Of these 279 or 13.2% were seen for different dental conditions. The incidence of acute or emergency orofacial conditions was 18 cases or 6% of the total participants. The most frequent injury was lip contusion with four cases and the sport that experienced more injuries was basketball with three cases.

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Key words: sport dentistry; orofacial trauma; mouthguard; team dentist; sports delegation

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Accepted 24 February, 2004

Problems in the orofacial area during sports competition are not very frequent but many times they are the principal cause of poor performance by a participant. In a study carried out in 1991 by The Center of Sports Health and Exercise Sciences of Puerto Rico, on different patterns of injuries in different sports, of the 791 body injuries 34 or 4% were restricted to the orofacial area (1).

The prevalence of tooth injuries in children and adolescents has been described in the past in different studies (2, 3). One survey of the dental literature indicates that there is a variance of 4–14% in the patients examined (4). This percentage could vary even more given that many of the orofacial traumas that occur in different circumstances are not reported. It is interesting to note how orofacial

trauma has increased over the last 50 years. This may be because of the fact that today we have more people practicing sports and most of them are stronger and more aggressive than in the past. Studies reveal that males are two to three times more likely to suffer from some kind of dental and orofacial trauma than females (5). The age in which these injuries are more frequent is between 8 and 15 years (4, 5). In a majority of the cases, trauma was to the anterior maxillary region, especially the two central incisors and the upper lip (7). The importance of prevention, especially in contact or collision sports, should be emphasized. Preventing injuries to the orofacial area is one of the challenges that sport dentistry faces today. One of the most unpleasant situations is that of loosing a tooth in the anterior area of the face as a consequence of a blow (Fig. 1). This affects the athlete physically as well as mentally. Many times appropriate rehabilitation of this type of injury requires extensive dental procedures at very high prices.

However, this situation can be avoided with adequate orientation and prevention measures. It is vital that the dentist is adequately trained to assist in this type of emergency and that he or she is conscious of the different alternatives to treat the participant going through this situation.

One of the most important pieces of equipment that an athlete should have, especially if he or she is participating in a contact sport, is a custom-made and properly fitted mouthguard (8). The difference between a stock and a custom-made mouthguard is so great that it will determine the degree of injury (Fig. 2).

Material and methods

The study population consisted of 279 athletes of different sports (16–50 years of age) mostly males. This random population arrived at the medical facility of the Puerto Rican Delegation for evaluation and dental treatment. A dental screening and record was performed for each athlete which included their name, age, type of sport practice, sex, medical and dental history and dental complaint (Fig. 3). The survey included dental evaluations, acute sport-related injuries, restorations needed and mouthguard fabrication. All calculations are based on the whole population seen for any of these types of dental services within the competitions.

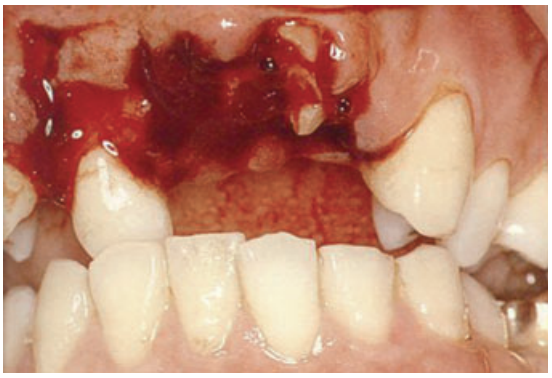

Fig. 1. Trauma maxillary anterior area.

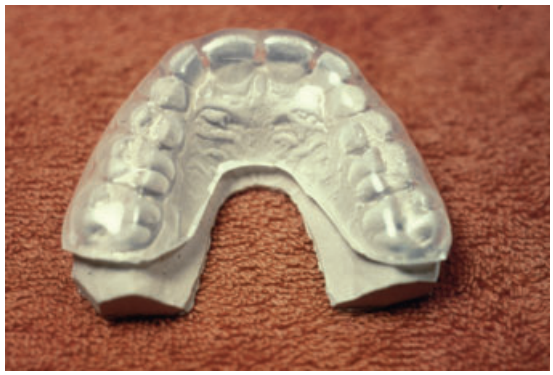

Fig. 2. Custom made mouthguard.

Fig. 3. Dr Muñoz examining a patient in the CAC Games, 1998.

Results

The total participants evaluated for dental care was 13.2% of the different delegations, accounting for a total of 488 dental encounters or 5.4% of more than 9000 encounters for all the medical and dental conditions.

Of this, 133 participants were seen for mouthguard construction, 52 for restorative work, 18 for dental emergencies or acute dental conditions and 76 for dental evaluations (Fig. 4).

The 76 cases seen for dental evaluations and follow-up were basically treated with medication or palliative procedures. Of the 18 acute conditions or emergencies the most frequent cases were those related to sport competition. The acute cases

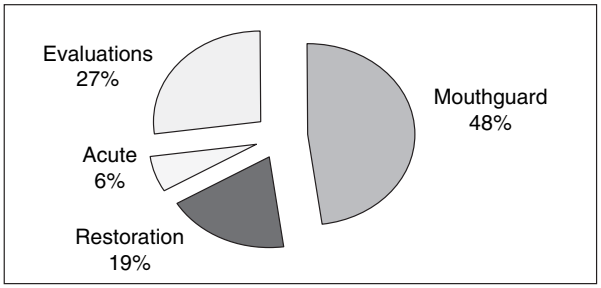

Fig. 4. Dental services 1982–2002.

represented 6% of all the dental conditions treated at the games. One tooth avulsion (boxing), two tooth fractures (field hockey/track and field), two lip lacerations (wrestling/basketball), three maxillary fractures (two basketball/one baseball), four lip contusions (two karate-do/two boxing), two periapical lesions (one baseball, one track and field, one basketball) and three periodontal abscess (one rifle shooting, one track and field, one administration) (Fig. 5).

Discussion

The main objective of this study was to examine the incidence of dental and orofacial trauma from a participating country in the Central American and Caribbean Sport Games.

Although the incidence of orofacial injury at the elite level is not high it is desirable to have someone adequately trained to help solve that particular health problem or emergency. Dental services should be established with enough time before the competition starts (months) in order to take care of any dental conditions such as caries or periodontal disease. When traveling with a team, especially a large group, you have to be very well equipped. Like the medical personnel the dentist has to carry in his bag everything necessary to deal with a dental or an orofacial emergency. Each dentist should prepare his or her 'Dentist Bag' according to their professional training (general dentist/oral surgeon).

We have to provide the necessary education on prevention of dental disease and construction of custom-made and properly fitted mouthguards for those participants who require them. Custom-made mouthguards should be made for sports such as: boxing, basketball, taek-won-do, karate-do, soccer, hockey, judo, wrestling and any other contact sport. If a thorough dental program is established in your country or team on a yearly basis the interventions of the dentist during competition should be very few. According to the dental literature the most frequent dental injury during athletics is lip contusion and/or lip laceration (6). This could be avoided or minimized if the athlete uses the proper protective equipment, a properly fitted mouthguard (9). In this study we had 18 dental and orofacial emergencies or acute injuries. Most of them were related to athletic competition and the intervention of the dentist was crucial. All of these conditions were treated successfully by the dentist and the athlete was able to compete excluding the athletes who suffered from tooth avulsion and the three maxillary fractures. It is interesting to point out that in these four cases none of the athletes were using a custom fitted mouthguard at the time of injury. Problems in the orofacial area are known to cause permanent and constant effects and demand the attention of those involved the sports organizations.

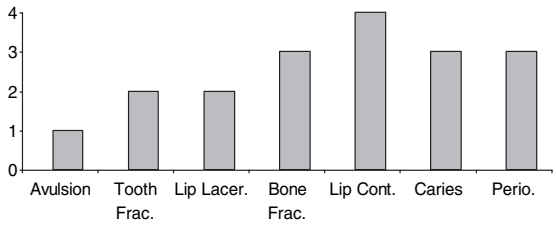

Fig. 5. Acute condition.

If the required personnel are available to solve these problems the health services provided to your delegation are going to be better and complete; this is one of the reasons why we believe that the participation of a dentist in the sports medicine team is necessary.

If we see the incidence of dental and orofacial conditions over a 20-year period there are some instances where there were no acute dental or orofacial conditions or emergencies during that particular competition, but in other instances the injury was severe, e.g. a maxillary fracture (Table 1).

Although we have a dental treatment program during the year (which includes various dental procedures and custom mouthguard fabrication) for the athletes, many of them missed the scheduled appointments and went to the Games with a high probability of suffering from an acute dental or orofacial condition such as: trauma, caries, or periodontal disease. This accounts for the high number of participants seen for mouthguard fabrication, evaluation, and restorative work. As our

Table 1. Number of interventions at the different games

Country (year)	Patients	Mouthguard	Acute condition	Restorative	Evaluation
Cuba (1982)	48	0	5	30	13
Dom. Rep. (1986)	21	0	0	5	16
Mexico (1990)	89	54	5	6	24
P.Rico (1993)	44	33	3	3	5
Venez. (1998)	52	34	5	6	7
El Salva. (2002)	25	12	0	2	11
Total	279	133	18	52	76

dental staff is very well equipped (medications, machine for mouthguard fabrication, dental materials and instruments) for the competition many participants prefer to have dental treatments at the site of the Games or medical facilities of the delegation as they have some time to spare. The first time custom-made mouthguards were made for our delegation was for the Central American Games of 1990 in Mexico, this may account for the high number of participants seen during that year. The compliance of using custom-made and properly fitted mouthguard in our delegation (contact sports) is close to 90%.

Conclusions

1 Of all the participants who made up the official delegations of Puerto Rico at the sixth Central American and Caribbean Sports Games, 279 athletes or 13.2% required some type of dental service.
2 The incidence of acute dental conditions or emergencies during this period was 18 cases or 6% of the total participants. In many instances the nature of the injury and dentist intervention were crucial for athlete participation.
3 The National Olympic Committees of the different countries participating at the Games should include a dentist as an integral part of their medical team.
4 The dentist should be designated to offer assistance mostly in areas such as: boxing, taek-won-do, karate-do, field hockey and basketball in the Central American and Caribbean Sports Games.
5 A custom-made and properly fitted mouthguard should be made for all participants practicing contact or collision sports.

Acknowledgements – We like to express our appreciation to Dr Marta Rivera and Dr José Muñoz, Team Dentists of the sports delegation of Puerto Rico, for their collaboration in this study.

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