

Epidemiological and Clinical Profile of Maxillofacial Trauma and Associated Injuries in the Practice of Combat Sports in Yaoundé, A Cross-Sectional Study

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Abstract

Introduction: Dento-maxillary trauma is damage to the complex made up of the teeth and their underlying bone support tissues during any physical and sporting activity of everyday life. These traumas are frequent during the practice of combat sports with an incidence unknown in our context. The aim of this study was to determine the epidemiological and clinical profile of these traumas in the practice of combat sports in Yaoundé.

Materials and Methods: We carried out a descriptive and prospective cross-sectional study over a period of three months, from January to March 2020. All the combat sports practitioners were included.

Results: During the study period, 56 on 380 licensees presented a dento-maxillary trauma in combat sports practice giving a prevalence of 14.74%. The average age of the victims was 24 years old with 80.35% of men. Soft tissue wounds (37.5%) and coronary fractures (32.14%) were the most common injuries. Karate was the most traumatic with 33.93% of injuries followed by boxing (25%). The majority of accidents were caused by kicking and punching (83.93%). Licensees with 8 years or more in seniority were the most victims with 48.21% of cases. The anterior teeth were the most injured. Among the victims, 26.78% did not wear mouthguards and 53.33% of them motivated the lack of financial means as reason.

Conclusion: Dento-maxillary trauma are not frequent among combat sports practitioners in Yaoundé. Karate and boxing are the most dento-maxillary trauma, especially during training. Faced to these risks, it is necessary to pay particular attention to these sports in order to make combatants aware of the measures to be taken in the prevention of injuries.

Keywords: Maxillofacial Trauma; Combat Sports; Yaoundé

Introduction

Sport is an activity that requires physical effort aimed at improving the physical condition of the individual. However, many sports activities and their level of practice, including combat sports, increase the risk of dento-maxillary trauma. In the literature, the prevalence of trauma in dentistry ranges from 44.1 to 49% in sports [1,2]. In Cameroon, in 2015, dental and facial injuries represented 34.1% of ac-

idents in sport [3], making the latter a risky practice. To this end, it is important to know the prevalence of dento-maxillary accidents in order to establish a prevention method making it possible to limit late complications.

Aim of the Study

The aim of our study was to assess the epidemiological and clinical profile of dento-maxillary accidents among combat sports practitioners in the city of Yaoundé.

Materials and Methods

This was a descriptive and prospective cross-sectional study over a period of three months from January to March 2020 within different clubs in Yaoundé, where combat sports are practiced. Were included all the practitioners of combat sports in the various clubs of Yaoundé.

Data collection was carried out using an administered survey and the variables studied were age, sex, nature and location of lesions, mechanism of occurrence of lesions and experience with discipline practiced. Data were analyzed using Epi info version 7.0 software.

We requested and obtained the agreement of the ethics committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I to conduct this study.

Results

During the study period, we identified 380 licensees practicing combat sports in the city of Yaoundé. Our inclusion criteria made it possible to collect 56 practitioners who presented dento-maxillary traumas (Figure 1), giving an overall prevalence of 14.74%.

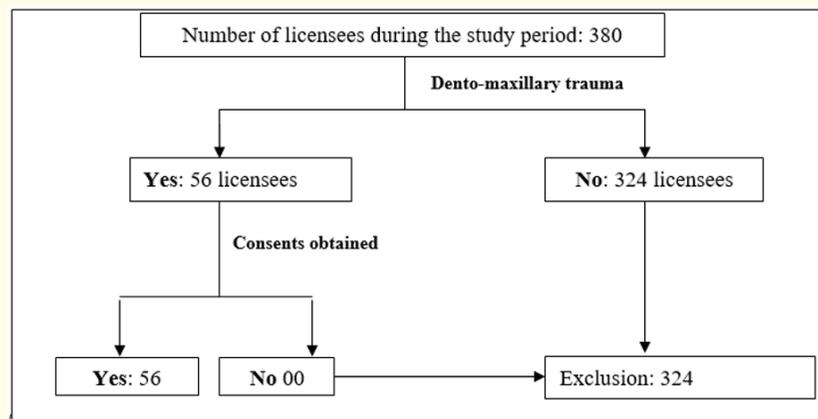


Figure 1: Flow chart of patient's inclusion.

In the selected sample (n = 56), 45 licensees were male (80.35%) and 11 female (19.65%), with a sex ratio of 4.09 in favor of men.

The age of the victims varied from 15 to 45 years with a preponderance of the class of 20 to 30 years with 50% of the subjects. The age and gender distribution in the study population is given in table 1.

Variables	Categories	n	%
Kind	Male	45	80.36
	Female	11	16.14
Ages (years)	[15 - 20]	19	33.93
	[20 - 30]	28	50
	[30 - 45]	9	16.07

Table 1: Age and gender distribution in the study population.

The distribution of dento-maxillary trauma according to the discipline presented in figure 2 shows that karate and boxing were the most traumatic disciplines with respectively 33.93% and 25% of the cases in our sample.

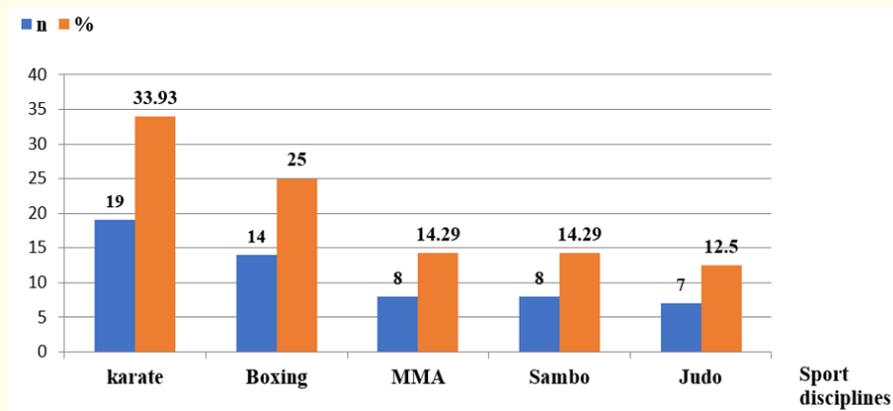


Figure 2: Distribution of dento-maxillary trauma according to the disciplines practiced.

MMA: Mixed Martial Arts.

Of the dento-maxillary lesions observed in our sample and detailed in table 2, soft tissue wounds were found in 33.93% of cases (n = 19) followed by coronary fractures (30.37%, n = 17).

Nature of lesions	n	%
Soft tissue sores	19	33.93
Coronary fractures	17	30.37
Dental expulsion	9	16.07
Partial dislocation	8	14.28
Bone fractures (mandible and maxilla)	3	5.35
Total	56	100

Table 2: Nature of the dento-maxillary lesions.

The dental lesions concerned teeth of the maxillary arch in 79.41% of cases (n = 27) while in 20.59% of cases (n = 7) they concerned teeth of the mandible. These lesions concerned the anterior teeth, in particular the incisors.

The bone fractures represented 5.35% of our sample and concerned the maxilla with two cases and the mandible with one case. The mandibular fracture was bifocal and involved in a boxer (Figure 3).



Figure 3: Mandibular fracture in a boxer with dental fracture on the 46 (arrow).

The mechanism of occurrence of dento-maxillary trauma was in 83.93% of cases (n = 47) by direct punches or kicks and in 16.07% of cases (n = 9) by fall.

The distribution of injuries according to the mechanism, detailed in table 3, shows that direct hit injuries were most often found in karate with 33.93% of cases (n = 19) and in boxing with 25% of cases (n = 14) while judo generated trauma by fall with 12.5% of cases (n = 7).

Mechanisms	Disciplines					Total n (%)
	Judo n (%)	Karate n (%)	Boxing n (%)	MMA* n (%)	Sambo n (%)	
Fall	7 (100)	0 (00)	0 (00)	1 (12.5)	1 (12.5)	9 (16.07)
Punches/Kicks	0 (00)	19 (100)	14 (100)	7 (87.25)	7 (87.25)	47 (83.93)
Total	7 (12.5)	19 (33.93)	14 (25)	8 (14.29)	8 (14.29)	56 (100)

Table 3: Distribution of trauma mechanisms according to disciplines.

*MMA: Mixed Martial Arts.

The occurrence of accidents was more frequent during training (57.14%) than in competition (42.86%). And considering the number of years of practice of this type of sport (Table 4), the licensees with more experience constituted 48.22% (n = 27) of the cohort.

Seniority in the practice (in years)	Types of injuries n (%)					Total
	WSP	CF	PDD	DE	BF	
[1 - 4]	3 (14.29)	0 (0)	2 (25)	1 (11.11)	0 (0)	6 (10.71)
[4 - 8]	7 (33.33)	10 (55.56)	3 (37.5)	3 (33.33)	0 (0)	23 (41.07)
[8, +]	9 (52.38)	7 (44.44)	3 (37.5)	5 (55.56)	3 (100)	27 (48.22)
Total	19 (33.93)	17 (30.37)	8 (14.28)	9 (16.07)	3 (5.35)	56 (100)

Table 4: Types of lesions according to years of experience.

WSP: Wounds of Soft Parts; CF: Coronary Fractures; BF: Bone Fractures; PDD: Partial Dental Dislocation; DE: Dental Expulsion.

Wearing mouthguards was observed in 73.21% (n = 41) of licensees who were victims of dento-maxillary injuries against 26.79% (n = 15) who did not wear it. Considering the type of injuries observed, there was a higher frequency in the group of mouthguard wearers (Figure 4).

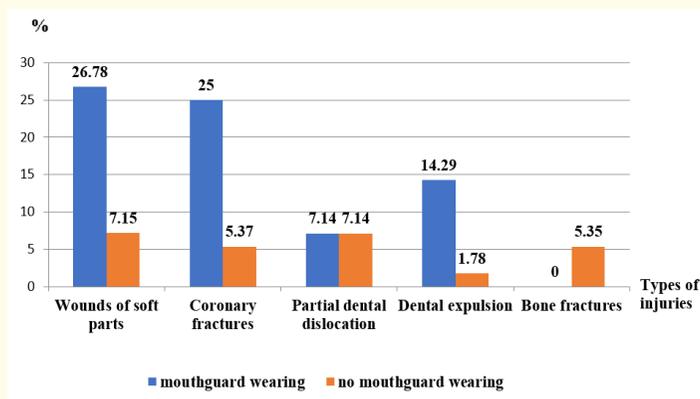


Figure 4: Distribution of injuries according to whether the mouthguard is worn or not.

The reasons given for not wearing mouthguards were the lack of financial means to obtain them, mouth discomfort when wearing and finally the uselessness of mouthguards. Table 5 gives the distribution of these patterns in the population of non-wearers of mouthguards. In 53.33% of cases (n = 8), those concerned mentioned the lack of financial means for the purchase of these mouthguards.

Reasons for not wearing mouthguards	n	%
Lack of financial means	8	53.33
Discomfort in the mouth	1	6.67
No use	6	40
Total	15	100

Table 5: Distribution of non-wearers of mouthguards according to the reasons mentioned.

Discussion

Sociodemographic profile

Fighting sports are ubiquitous in the world with variations between disciplines which are sometimes very subtle. Their practice more often attracts male subjects than the opposite sex as demonstrated by our study (80.35% of men) and that of Vidovic D., *et al.* [4] in 2015 in Croatia (79.1% men). It is sports requiring physical and athletic aptitudes. The practitioners of this type of sports are young with the majority of the ages in the third decade of life. In the present study, the mean age was 24 years ± 0.7, in agreement with the work of Diallo., *et al.* in Mali in 2006 [5] who found a mean age of 23 years.

The game rules of the vast majority of combat sports do not prohibit blows to the face of the opponent. Also, we found that karate (33.93%) and boxing (25%) were the most traumatic sports due to the multiplicity of blows received in the orofacial region. Agbor., *et al.* find similar results in a study carried out in Cameroon in 2012 which had shown that 73.3% of karate trauma were dentofacial [3].

Dento-maxillary trauma

Prevalence

In the light of the literature, maxillofacial trauma are the most frequent in the practice of combat sport [5,6]. The prevalence of practitioners with dento-maxillary trauma in our study was 14.74%. Agbor, *et al.* in Cameroon in 2012 [3] reported 31.7% of dento-facial trauma in the practice of contact sports. This latest study covering all contact sports, including team sports, had identified a multitude of injuries during a single meeting.

Nature of the dento-maxillary lesions

Lacerations or wounds, bone and dental damage are the lesions most often observed in maxillofacial trauma in combat sports [2]. In Yaoundé, the most frequent lesions were soft tissue wounds (33.93%) and coronary fractures (30.37%). These figures, although declining, still remain high, as the study of Gholamreza Shirani, *et al.* in 2010 in which they found, in terms of recurrences, 69.2% of lacerations and 59.7% of dental lesions [2]. The more or less regular use of protective equipment (helmet and mouthguards) could explain the decrease in these traumas among athletes.

In our sample, there were three bone damage, with 5.35% of cases. Gholamreza Shirani, *et al.* out of a total of 95 cases of maxillofacial trauma linked to combat sports, found two cases of mandibular fractures [2]. Bone damage to the mandible and maxilla is relatively not frequent compared to other bone damage of the face because of the protections and less exposure to shocks.

Frequency of dento-maxillary trauma according to the experience of practitioners

The challenges of competition would be a determinant factor of the occurrence of trauma during the practice of high level sports. Also, in accordance with the data in the literature [3,7], the dento-maxillary traumas in our study were most observed in the most experienced practitioners, eight years and above (48.22%) compared to those less than four years (10.71%). These are the most experienced who show up to competitions and invest the most in training.

Location of dento-maxillary lesions

Due to its lower density than that of the mandible, the maxilla was by far the most frequent site of dental lesions, with 78.57% of cases with a predilection for the central incisors. In accordance with these results, Jorg D Tschann and al in Bern in 2003 [8] observed that the majority of dental trauma affected the maxillary arch with hegemony for the involvement of the central incisor in 50 to 90% of cases. Their most anterior position is the only explanation for this observation. Most often, these were coronary fractures (32.14% in our study); Gholamreza Shirani, *et al.* found prevalence of the order of 59.7% [2].

Mechanisms of dento-maxillary accidents and associated lesions

During the practice of sports in general, two mechanisms are in the origin of the dento-maxillary traumas, the fall and the direct blows. In fact, punches and kicks represented 83.93% of the etiologies of dento-maxillary trauma in our study. They were much more common in karate and boxing. Judo was the main discipline that generated the fall injuries with seven cases followed by MMA and Sambo.

Place of occurrence of dento-maxillary accidents

The occurrence of accidents was more frequent during training (57.14%) than in competition (42.86%) with a greater frequency of soft tissue wounds and coronary fractures in both cases. These findings are similar to those of Diop in Senegal in 2009 who found that

trauma in combat sports was recorded during training in 75% of cases [9]. This result is different from the study carried out by Newsone, *et al.* [10] in 2001 which showed a high rate of oral trauma during competition compared to training. This difference could be explained in our study by an increase in the level of engagement of practitioners in training. Indeed, as a deadline approaches, trainings become more and more intense with practitioners who give themselves to the full in order to perform well. This high percentage of accidents in training could also be justified by a high number of practitioners who train more than they participate in competitions, associated with this the more or less regular absence of intra and extra-oral protections. and finally the number and duration of training sessions which take several weeks compared to competitions which are only for few minutes time.

Preventive measures for practitioners facing dento-maxillary accidents

Wearing mouthguards requires knowledge. Wearing a mouthguard was practiced by 73.21% of the graduates in our study. In this population, the most frequent lesions were soft tissue wounds (26.78%) and coronary fractures (25%). This result differs from that of Vidhartri T, *et al.* [11] in a study conducted in India in 2014 which showed that practitioners who did not wear mouthguards had more dental trauma than those who did. This difference could be explained in our study by the fact that mouthguards were not very useful on preventing soft tissue damage.

The number of practitioners who did not use the mouthguard was 15, or 26.79%. Of this number, 53.34% had mentioned financial difficulties in obtaining them. This result is consistent with that of Clément Chinedu A, *et al.* [12] in a study in Nigeria in 2011 which showed that more than half of athletes had heard of and seen mouthguards but they did not have any access for reasons of discomfort (speech and breathing problems) and high cost. This could be explained by the lack of information concerning the use of mouth protectors for practitioners, associated with a weak economic situation of our populations.

Conclusion

Dento-maxillary accidents are uncommon among combat sports practitioners in the city of Yaoundé. Karate and boxing are the sports that generate the most dento-maxillary trauma, especially during training. Faced with these risks, it is necessary to pay particular attention to these sports in order to make combatants aware of the measures to be taken in the prevention of accidents.

Conflicts of Interest

The authors declare no conflict of interest.

Contribution of the Authors

All authors have contributed, read, and approved the final version of this article.

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