ETIOLOGY AND PATTERN OF DENTOALVEOLAR INJURIES IN PATIENTS AT ARMED FORCES INSTITUTE OF DENTISTRY, RAWALPINDI

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ABSTRACT

Objectives: To determine the etiology and pattern of dentoalveolar injuries in patients presenting to oral surgery department of Armed Forces Institute of Dentistry, Rawalpindi.

Study design: Cross sectional study

Place and duration of study: Oral Surgery department, Armed Forces Institute of Dentistry, Rawalpindi. One year from September 2008 to August 2009.

Patients and methods: 138 consecutive patients presenting to oral surgery department with dentoalveolar injuries irrespective of the age and gender were included in the study. Edentulous patients, patients with only soft tissue injury and patients with other maxillofacial injuries but no dentoalveolar injury were excluded from the study. The included patients were asked about the cause of injury and the pattern of injury was noted clinically. This information was collected on specially designed proformas. All injuries were classified according to Andersean's classification.

Results: Out of these 138 patients, 111(80.4%) were males with a male to female ratio of 4.1:1. The age ranged from 2-65 years with a mean age of 21.22years. RTA was the most common cause of injury and was seen in 58 (42%) patients. Followed by fall noted in 52 (37.7%) patients. Other causes observed were contact sports in 7 (5.1%), violence in 4 (2.9%) and work place accident in 7 (5.1%) patients. Regarding pattern, the most common type of injury was avulsion and subluxation followed by crown fractures, luxation, root fractures and tooth displacements in various directions.

Conclusion: Males especially the young lot was more affected by dentoalveolar trauma. RTA and fall remain the main causes of these injuries in our population. Avulsion, subluxation and luxation were the most common patterns of trauma observed. Maxillary incisors were the most commonly affected teeth in these traumatic episodes.

Key words: Dentoalveolar trauma, Luxation, Avulsion

INTRODUCTION

Dentoalveolar injuries are those injuries involving the teeth, the supporting structures, gingiva, oral mucosa, alveolar process of the maxilla or mandible, with or without injuries of the adjacent soft and hard tissues. These injuries include the fracture, displacement or avulsion of teeth and fractures of the alveolar process[1].

The etiology of dentoalveolar injuries varies from one country to another and even within the same country depending on the prevailing socioeconomic, cultural and environmental factors.[2] The different etiological factors include falls, road traffic accidents, interpersonal violence, contact sports, child abuse, epilepsy, mental disorders etc[3]. Fall is the most common etiological factor in children[4] while road traffic accidents being the main cause in adult patients.[5]

Dentoalveolar injuries are classified as dental hard tissue, gingival/periodontal, alveolar bone or a combination of these associated with or without facial fractures and soft tissue injuries[1].

Dentoalveolar injuries are quite common especially in young patients[6] and normally present as an emergency requiring prompt diagnosis and well timed management. Incidence of such injuries is more in children as compared to adults with involvement of central incisors most often.[7] Male sex predilection is observed in dentoalveolar injuries (Male: Female is 3.3:1)[8]. Predisposing factors can be

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class II malocclusion with lip incompetence having labially proclined incisors.

These injuries are diagnosed on clinical examination augmented by conventional radiographs like periapical radiographs, occlusal radiographs and orthopantomograms.[6] The goal of the treatment is to restore function and esthetics and the treatment modalities vary according to the nature of injury.[9]

The purpose of this study was to highlight the etiology and pattern of dentoalveolar injuries in our local population. As a significance, this research can enable us to recommend various preventive measures to the concerned authorities, to reduce the incidence of dentoalveolar injuries in patients, especially those who are very young. Moreover this research will apprise the clinicians to suspect and look for dentoalveolar injuries in patients presenting with facial fractures or soft tissue injuries only.

PATIENTS AND METHODS

This cross-sectional study was carried out at the Oral Surgery department of AFID, Rawalpindi. Prior permission was taken from the Ethical Committee of AFID. Informed written consent was obtained from all the patients. All patients with dentoalveolar injuries, irrespective of age and gender were included in the study. Patients with only soft tissue injury, patients having maxillofacial injuries but not involving the dental tissue and edentulous patients were excluded from the study. A detailed history of all the patients who were willing to take part in the study was taken followed by a thorough extra and intra oral examination. Maxilla and mandible were palpated thoroughly. All teeth were inspected, percussed and evaluated for trauma. Basic radiographic investigations like intra oral periapical radiograph, orthopantomogram, postero-anterior face/mandible, occlusal view and chest radiograph were carried out where deemed appropriate.

Injuries were classified according to the standard Andreason's classification and data was collected on specially designed proformas. Data has been analyzed using SPSS version 17. Descriptive statistics were used to descriptive the data.

RESULTS

A total of 138 patients were included in the study presented to our department during the study period with dentoalveolar injuries. Out of these, 111 (80.4%) were males and 27 (19.6%) were females. Overall male to female ratio was 4.1:1. The age ranged from 2-65 years (mean 21.22 years).

Road traffic accidents (RTA) was the most common cause seen in 58 (42%) cases seconded by fall in 52 (37.7%) cases. (Table 1)

In these 138 patients total injuries sustained were 245. Regarding pattern of injuries, the most common injury pattern was tooth avulsion and subluxation seen in 16.7% of the injuries followed by luxation in 9.4% of the injuries. (Figure 1)

Significant number of patients sustained associated jaw bone fractures. Mandible was fractured in 28 (20.3%) cases and maxilla in 11 (8.0%) cases. A total of 295 teeth were involved in these 138 patients. Out of these 106 (35.9%) were maxillary central incisors, 65 (22%) were maxillary lateral incisors, 40 (13.6%) mandibular centrals and 35 (11.9%) mandibular lateral incisors. (Figure 2)

DISCUSSION

Dentoalveolar injuries are those injuries involving the teeth, the supporting structures, gingiva, oral mucosa, alveolar process of the maxilla or mandible, with or without injuries of the adjacent soft and hard tissues. These injuries include the fracture, displacement or avulsion of teeth and fractures of the alveolar process.[1]

Our study consisted of 138 patients of all ages and both the genders. In our study 111 patients were males and only 27 patients were female yielding an overall male to female ratio of 4.1:1. When this ratio was compared to a local study carried out at Mayo hospital Lahore [10], it was seen that this ratio was slightly less than that was seen in their study (5.2:1) but was quite different from a study carried out in University of Innsbruck Pensylvannia[11], where

a male to female ratio of 1.9:1 was seen. This shows that in our set up males are pre dominantly more affected and exposed to traumatic incidents than the females.

Mean age in our study was 21.22 years (Range 2-65 years) and showed that adolescents and young adults were more prone to these injuries. This figure is in accordance with other studies conducted at Lahore, India, Malaysia, Iran and United States, all stating that third decade is the most common age group[10-14].

RTA was the most common cause followed by fall. This fact also co-relates to similar studies carried out in various under developed countries where motor bikes are common and helmets, seat belts and traffic laws are not implemented[6,10,12,13]. Fall was the most common etiology in children, a fact well high-lighted in other studies as well[15]. In our study contact sports and interpersonal violence accounted for a very small percentage of injuries. This finding is also similar to what is reported from under developed countries and contradicts the finding reported from advanced countries where interpersonal violence and contact sports constitute a major etiological factor for dental injuries [10,11,12,13,14,15,16,17,18].

A total of 245 injury patterns were seen in these 138 patients. Avulsion and subluxation were the most common patterns observed in our study. Incidence of avulsion was higher in our study group (16.7%) as compared to what is reported in literature (7.4%)[11,17,19] while subluxation was significantly less in our population. Overall reported incidence of subluxation is upto 50%[11,19]. Crown fractures were observed in 22% cases and root fractures in 6.1% cases. Incidence of crown fractures was less in our group (22% compared to 37.5%) while root fractures were more frequent in our group (6.1% compared to 2.5%)[11,12,17,19,20].

Laceration was the most common type of associated soft tissue injury seen in 40 (29%) patients. Gingiva and lips were the most common sites. This incidence is significantly less than a study done in Malaysia where the reported incidence was 50%[14]. In 28 (20.3%) patients mandible was fractured and in 11 (8.0%) patients maxilla was fractured. This fact was a little strange as overall maxillary teeth were more commonly involved than the mandibular teeth and still mandible was fractured twice fold as maxilla.

The most frequently affected teeth were the maxillary incisors. They are more vulnerable as compared to other teeth to such injuries owing to their exposed nature and the chance of injury further increases as their anterior proclination increases[21]. This fact has been well documented in various other studies as well. An overall incidence of incisor trauma between the ages 6-50 years reported in a study conducted in the United States was upto 24.9%[11].

CONCLUSION

Males especially the young lot was more affected by dentoalveolar trauma. RTA and fall remain the main causes of these injuries in our population. Avulsion, subluxation and luxation were the most common patterns of trauma observed. Maxillary incisors were the most commonly affected teeth in these traumatic episodes.

RECOMMENDATIONS

Use of seat belts and wearing of helmets should be made compulsory for all the drivers. Persons involved in contact sports should be advised mouth guards. Trauma management kits should be made available in schools and teachers should be taught the general guidelines for handling dentoalveolar injuries so as to buy time before definitive treatment can be sought. Similarly the clinicians / surgeons treating the trauma patients should take notice of any co-existing dental injury in the primary survey so that these may be managed as early as possible. A chest radiograph should be advised in case there is a history of engulfed or swallowed tooth. Orthodontic treatment may be offered to patients with proclined anterior teeth in order to decrease the chances of possible injury to these teeth.

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Table 1: frequency of various causes of Dentoalveolar injuries (n=138)

Cause	Frequency	Percentage
Road Traffic Accidents	58	42%
Fall	52	37.7%
Contact sports	7	5.1%
Work accidents	7	5.1%
Interpersonal violence	4	2.9%
Epilepsy	3	2.1%
Bomb blasts	4	2.9%
Hit by family member at home	2	1.4%
General Anesthesia intubation	1	0.7%

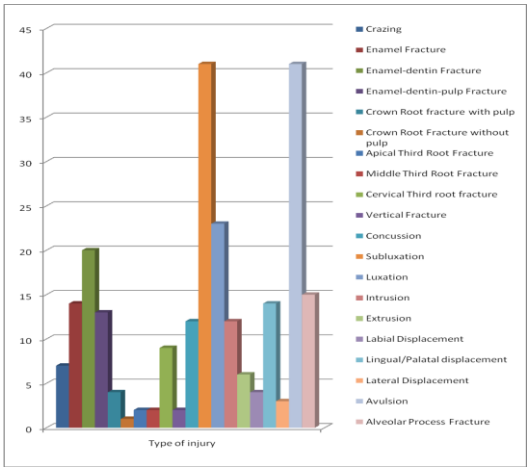

Figure 1: Pattern of dentoalveolar injuries (n=245)

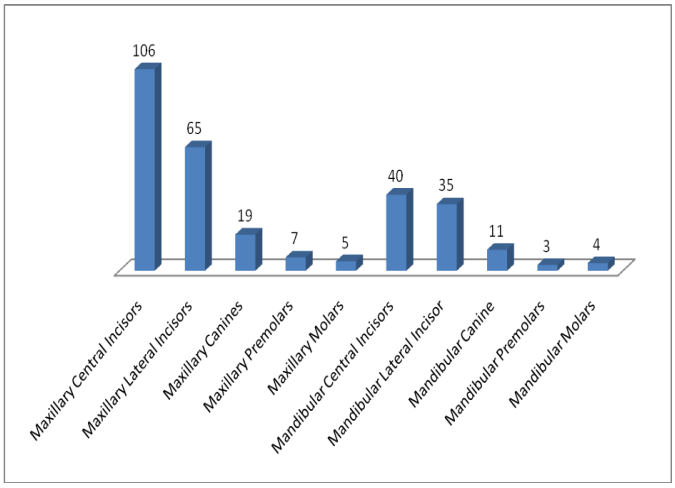

Figure 2: Teeth involved in dentoalveolar injuries (n=295)