



## Epidemiological differences among emergent maxillofacial fractures

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### ARTICLE INFO

### ABSTRACT

#### Article History

Received 25 / 03 / 2013

Accepted 06 / 04 / 2013

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#### Keywords:

Emergency  
Epidemiology  
Maxillofacial fracture  
Maxilla

Maxillofacial fractures are resulted from various types of face trauma. These patients require multidisciplinary approach during diagnosis and management in emergency department. The aim of this study was to present a large series of various traumas to the face in an attempt to identify the relation between the injury pattern and fractures of face. Hospital records of 275 patients treated for maxillofacial trauma from January 2008 to august 2011 were reviewed retrospectively. There was no significant difference in age between male and female patients. Most common injuries were mandibular, zygomatic and midface fractures. Zygomatic arch fractures were significantly higher in automobile and interpersonal violence. Nasal fractures were significantly higher in interpersonal violence cases. Maxilla fractures were significantly higher in automobile accidents, motorcycle accidents. Mandible fractures were nearly equally distributed in various injury causes and no significant relation was found between any types of injury. Common causes of maxillofacial traumas are assaults, motor vehicle accidents and falls. Fractures of mandible are most common fracture of the face in this study. Midface fractures were related with high impact collisions.

*J. Exp. Clin. Med., 2013; 30:115-117*

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### 1. Introduction

Maxillofacial fractures are the results of various types of face trauma. The trauma to the face may be isolated or together with other system injuries (Van den Bergh et al., 2012; Erdmann et al., 2008). These patients require multidisciplinary approach during diagnosis and management in emergency department (ED). The treatment is combined surgical and medical treatment. The treatment uses considerable resources (Allareddy et al., 2011). Also the public health impact of these injuries needs to be highlighted (Czerwinski et al., 2008; Lee, 2009; Allareddy et al., 2011; Centers for Disease Control and Prevention, Leading causes of death, <http://www.cdc.gov/nchs/fastats/lcod.htm> Accessed 20 October, 2011). Maxillofacial trauma incidence varies in different countries, even in different regions of countries. Main causes are motor vehicle accidents, falls, interpersonal violence and sport injuries in developed countries (Van den Bergh et al., 2012).

Maxillofacial trauma is more related with interpersonal violence in undeveloped countries (Van den Bergh et al., 2012). We believe that there is a need of articles about maxillofacial injury causes in Turkey. The aim of this study was

to present a large series of various traumas to the face in an attempt to identify the relation between the injury pattern and fractures of face.

### 2. Material and methods

The hospital records of 310 patients treated for maxillofacial trauma from January 2008 to August 2011 were reviewed and analyzed retrospectively. We used ICD-10 codes to identify maxillofacial trauma patients admitted to ED from hospital database. Twenty patients were excluded from study due to lacking of sufficient medical records. Fifteen patients with multi-trauma and alcohol consumption were excluded from the study. Study included 275 patients.

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 17.0. Student t test for parametric data and Chi-square test for non-parametric data were performed.

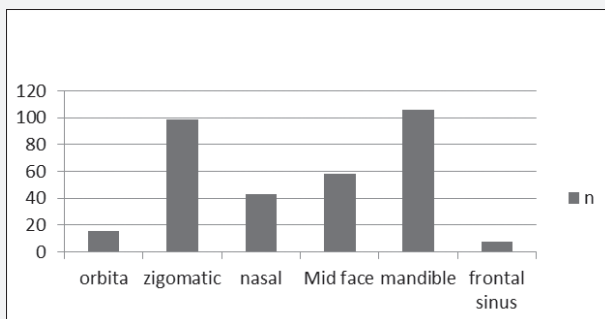
### 3. Results

Patient population consisted of 221 males with a mean age of 33.57±14.26 and 54 females with a mean age of 36.24

±19.23. There was no significant difference in age between male and female patients. Men tend to be the victims of facial fractures more than women are. Most common causes of maxillofacial traumas were interpersonal violence, automobile accidents and falls (Table 1). Most common injuries were mandible, zygomatic and midface (maxillary region) fractures in the study group (Fig. 1).

**Table 1.** Distribution of the patients according to injury causes.

Injury Type	n	%
Automobile accident	74	26.9
Pedestrian hit	7	2.5
Motorcycle accident	28	10.1
Violence	99	36.0
Fall	65	23.7
Sport injury	2	0.7
Total	275	99.9



**Fig. 1.** Patients according to injuries. Most common injuries were mandible, zygomatic and midface fractures in the study group.

**Table 2.** Relation of injury types and location

	Orbita	Zygomatic Arch	Nasal	Midface	Mandible	Frontal Sinus
Automobile accident	4	38	4	33	34	2
Pedestrian hit		4	1		1	1
Motorcycle accident	1	15	1	13	10	1
Violence	8	27	23	7	45	2
Fall	3	23	14	5	26	2
Sport injury		2				

Zygomatic arch fractures were significantly higher in automobile accidents ( $p=0.018$ ) and interpersonal violence ( $p=0.002$ ). Nasal fractures were significantly higher in interpersonal violence cases ( $p=0.015$ ). Maxilla fractures were significantly higher in automobile accidents ( $p=0.001$ ) and motorcycle accidents ( $p=0.002$ ) (Table 1). Mandibular fractures were nearly equally distributed in various injury causes and no significant relation was found between any type of injury (Table 2).

#### 4. Discussion

Previous studies have shown that maxillofacial injuries more frequently affected men than women (Czerwinski et al., 2008; Lee, 2009; Allareddy et al., 2011). Our study also suggests that men visit emergency department more than women do,

for maxillofacial trauma. Mean age of the study shows that the patients in forth decade is the most affected age group. Previous studies have shown that most common causes of maxillofacial traumas are assaults, motor vehicle accidents and falls. Existing research has shown similar frequencies for injury causes (Fig. 1). Order of importance varies in different economic and cultural populations (Czerwinski et al., 2008; Lee, 2009; Allareddy et al., 2011).

Local and regional factors may cause some effect on the etiology and epidemiology of facial fractures (Keles et al., 2006; Işık et al., 20012; Czerwinski et al., 2008; Ozkaya et al., 2009). Recent studies found that nasal bone was the most commonly fractured part of the face (Qudah et al., 2002; Bakardjiev et al., 2007; Allareddy et al., 2011; Thoren et al., 2009; Hwang et al., 2010; Lee et al., 2010; Lima Júnior et al., 2011). Our study shows contrast with this finding. Fractures of the mandible were most common injuries of the face. Nasal fractures were significantly higher in interpersonal violence ( $p=0.015$ ). During the ED practice, patients suffering interpersonal violence have to be carefully evaluated for nasal fractures. Nasal fractures in ED usually do not require inpatient hospitalization. Nasal fractures may need reduction to reduce existing esthetic or breathing complications.

Prior studies reveal that fractures of the mandible are most common site for maxillofacial fractures (Tuncer et al., 1996; Gassner et al., 2003; Erdmann et al., 2008; Lee KH, 2009; Van den Bergh et al., 2012). The mandible is the most vulnerable bone, related with mobility and anatomy. Our study suggests the same findings (Fig. 1). Mandible fractures were nearly equally distributed in various injury causes (Table 2). This shows that various traumas may cause mandible fractures. Zygomatic arch fractures were significantly higher in automobile accidents and interpersonal violence. Zygomatic arch fracture was the second most common fracture of the face in this study. Injury involving only zygomatic arch indicates that assaults are usually caused by a single blow to the face.

Midface fractures were significantly higher in automobile accidents and motorcycle accidents. Usually high impact collisions caused these fractures (Lima Junior et al., 2011). Interpersonal violence, falls, sport injuries were not related with maxillary fractures. Concomitant fractures of skull and other systems may be more associated with maxillary fractures (Işık et al., 2012). Revealing the relations of associated injuries and maxillofacial traumas was not the concern of this study. EDs serve as the first point of entry into the hospital system for a significant percentage of patients seeking treatment for maxillofacial injuries (Allareddy et al., 2011). Maxillofacial traumas have to be evaluated seriously in emergency department. In addition, physician has to maintain adequate multidisciplinary approach for the optimal treatment of maxillofacial traumas (Gassner et al., 2003).

#### Conclusions

Most common causes of maxillofacial traumas are assaults, motor vehicle accidents and falls. Fractures of the mandible are most common site for maxillofacial fractures. Zygomatic arch fracture was the second most common fracture of the face in this study. Midface fractures were related with high impact collisions.

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