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Original Research

## Epidemiology of maxillofacial trauma in a university hospital of Kermanshah, Iran

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### ABSTRACT

**Purpose:** Maxillofacial surgery is a newly established department in the province of Kermanshah. The aim of this study was to present the pattern of facial injuries among the patients from December 2010 to February 2014.

**Methods:** Hospital records of 1727 patients were reviewed retrospectively. Data collected included patients' name, sex, age, date of admission, etiology, type of facial injury, associated non-facial trauma and treatment modalities.

**Results:** 1096 patients sustained only a soft-tissue injury. 631 patients had skeletal fractures. The significant majority of patients (78%) were male and the others were female (22%). The mean ages of males and females were roughly similar ( $28.7 \pm 12.5$  for males versus  $29.7 \pm 15.4$  for females). Most patients were between 21 and 30 years old. Motor vehicle accident was the major cause of trauma (74.8%) followed by assault (13.2%) and fall (8.3%). Nasal fracture was the most frequent trauma (45.5%), followed by mandibular (29%) and zygomatic (24.9) fracture. Central nervous system was the commonest associated trauma. 72% of mandibular, 87% of maxillary and 84.8% of zygomatic fractures were reduced via open reduction and rigid internal fixation.

**Conclusion:** The results of our study depicted that the epidemiology of maxillofacial trauma varies not only from country to country, but also within a country. Treatment protocol has changed during the past 15 years, and like many like other regions, conservative methods have been replaced by open reduction and rigid fixation. The results also showed that the attempts to reduce road traffic-related traumas have not been sufficient and require to be revised.

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### 1. Introduction

Maxillofacial region is a prominent part of the human body that is susceptible to injuries [1] during motor vehicle accident, falling, assault or other miscellaneous activities. This type of injuries is considered a major problem from an anatomical, physiologic, esthetic and psychological standpoint [2]. Involvement of the central nervous, digestive, respiratory and olfactory systems secondary to maxillofacial trauma results in severe impairment of the patients, which necessitate multidimensional–multispecialty treatment. In

addition, many patients sustain multiple traumas in other parts of the body like extremities and abdomen [3]. All these contribute to significant cost of caring for these patients. Contemplating the time required for recovery and return to normal social and economic life, consequence of maxillofacial trauma would be a burden on society that cannot be measured easily [4].

Epidemiology of maxillofacial trauma varies not only in different countries but also in different areas within a country [5]. It is a multifactorial issue with socio-economic, cultural and demographic components. Understanding the frequency and pattern of facial injuries would help both administrative and caring providers be best prepared for treatment of these patients, establish preventive strategies, and set up clinical and research priorities.

Kermanshah is the largest city in western Iran (population: more than 884,000 in an area of 93 km<sup>2</sup>) with referrals from nearby cities and neighbor provinces. Maxillofacial surgery is a newly established department in Taleghani trauma center (a level III trauma hospital). Therefore, no data has yet been published with regard to epidemiology of such injuries. The aim of this study was to analyze

☆ Asian AOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

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the maxillofacial injuries during a period of 36 months in the principal trauma center of the province and to compare it with similar investigations around the world.

## 2. Materials and methods

Hospital records of 1727 patients with facial trauma treated in the department of maxillofacial surgery from December 2010 to February 2014 were reviewed and analyzed retrospectively. Data collected included patients' name, sex, age, date of admission, etiology, type of facial injury, associated non-facial trauma and treatment modalities. Facial injuries were documented as soft-tissue injury, nasal, mandibular, maxillary, zygomatic, orbital, nasal-orbital-ethmoid (NOE) and alveolar fracture. Soft-tissue injuries included lacerations and avulsions that required surgical interventions (i.e. simple or layered closure, skin flaps, and free skin grafts). Those zygomatic fractures with orbital components that needed open reduction through a periorbital approach (i.e. lateral brow, subciliary, subtarsal, and transconjunctival) were classified under the category of orbital fracture. If a patient sustained several facial fractures, all fractures were included but analyzed separately. Frontal bone fractures are usually treated by neurosurgeons in our center; therefore, this fracture was not considered as a major subtype in the present study. Associated non-facial trauma was categorized as central nervous (brain and the spinal cord), axial skeleton, upper limb, lower limb and abdominal injuries. Causes of injury consisted of motor vehicle accident (MVA), assault, falling and others. Patients' age was divided into six groups as 0–10, 11–20, 21–30, 31–40, 41–50 and over 50 years. This retrospective study was approved by the review board of Kermanshah University of Medical Sciences, Taleghani trauma center. Data were analyzed utilizing statistical package for the social science (SPSS) version 16.0. Analysis primarily consisted of descriptive statistics. In addition, *t*-test and chi-square test were used for comparison of parametric and non-parametric variables, respectively. Statistical significance was set at  $p \leq 0.05$ .

## 3. Results

Over a period of 3 years, 1727 patients were treated in the newly founded department of maxillofacial surgery. From the start-up of our department, more patients have been treated each year (2011: 340, 2012: 496, 2013: 775). 1096 patients sustained only a

soft-tissue injury. 631 patients had skeletal fractures. Of these 631 patients, 507 patients had fractures without any soft-tissue trauma and 124 suffered from both hard- and soft-tissue trauma.

### 3.1. Sex and age distribution

#### 3.1.1. Overall

Total number of patients was 1727. The age ranged from 4 month to 90 years. The mean age was  $29.6 \pm 14.7$  years. Most patients were between 21 and 30 years old (39.8%). Fig. 1 shows the overall demographics of the patients.

#### 3.1.2. Soft-tissue injury

1096 patients presented with soft-tissue injury without any fracture in their facial skeleton. Male to female ratio in this type of injury was 3.3. The mean age of males and females was  $30.2 \pm 15$  and  $29.7 \pm 16$ , respectively ( $p = 0.4$ ). 1039 patients did have trauma just in their face; however, 57 patients had injuries in other parts of the body. These non-facial-associated injuries included CNS involvement ( $n = 35$ ), upper limb ( $n = 8$ ), lower limb ( $n = 7$ ), axial skeleton ( $n = 4$ ), respiratory system ( $n = 2$ ), and abdomen ( $n = 1$ ).

#### 3.1.3. Facial fracture

In facial fracture group, males constituted the significant majority of patients (78%) and females accounted for 22% of patients. Patients' age ranged from 2 to 88 years old. The mean age of males and females was roughly similar ( $28.7 \pm 12.5$  for males versus  $29.7 \pm 15.4$  for females) without a statistically significant difference between the two groups ( $p = 0.4$ ). With increasing age, the incidence of trauma increased until the third decade of life. The majority of patients were between 21 and 30 years old (42%). Over 30 years of life, the incidence gradually declined. Details of gender and age distribution are depicted in Fig. 2.

### 3.2. Seasonal distribution

As shown in Table 1, most patients were injured in summer and winter. Summer represented most soft-tissue injuries while facial fractures had taken place in winter. There was no seasonal difference for female patients and almost all differences were pertaining to males.

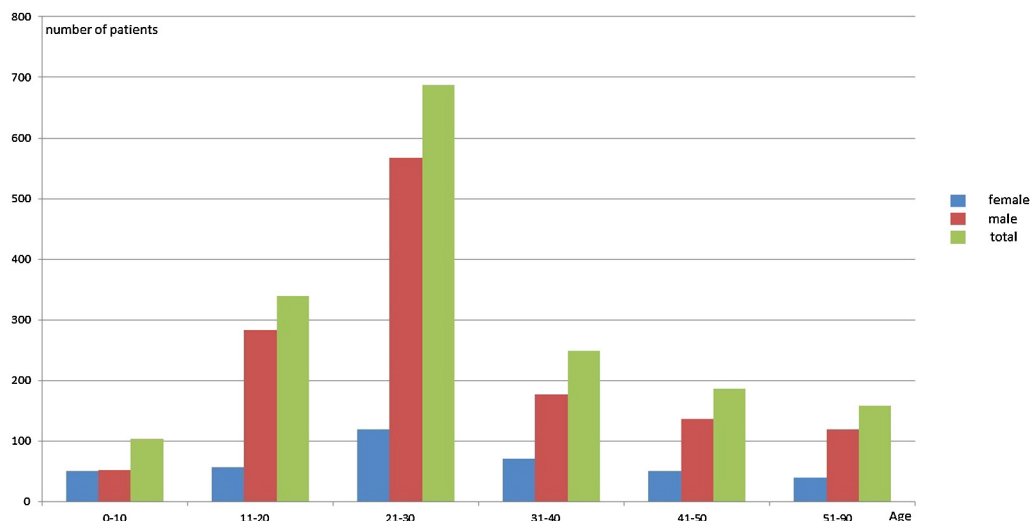


Fig. 1. Age-specific distribution of all patients.

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