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Prevalence of maxillofacial fractures in hospital patients: A five year retrospective study

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Abstract

***Background and objective*:** Damages to the oromaxillofacial region, if not diagnosed and treated in a timely manner, will cause permanent, serious clinical problems because of the characteristics of this anatomical region. Accordingly, the present study was performed on a 5-year investigation of epidemiology of oromaxillofacial fractures in patients admitted to Shahid Madani Hospital, Karaj, Iran.

Material And Method: In this descriptive cross-sectional study, 235 medical files of patients with damages to the oromaxillofacial region available in the archive of Shahid Madani Hospital, Karaj from 2013 to 2018 were chosen as census and examined. Demographic variables including site and cause of fracture were recorded for each patient on information forms. The collected data were analyzed by SPSS 17 software and presented as descriptive statistics.

***Result*:** In this study, out of 235 patients with oromaxillofacial fractures, 178 (75.7%) were male and 97 (41.3%) were female, respectively. The mean age of the patients was 30.96 ± 14.91 years. The main affected anatomical regions were as follows: Mandible 269 cases (49.17%), maxilla 117 cases (21.39%), and cheekbone 51 cases (9.32%). Accidents occuring with motor vehicles was the main cause of these fractures in 132 patients (56.2%).

Conclusion: The results of the present study indicated that the fractures of oromaxillofacial regions were more common in men, young people, and middle-aged individuals, and mostly occurred in the mandible, maxilla, and cheekbone, with the main cause of these fractures being accidents happening with motor vehicles.

Keywords: Facial Injuries; Jaw Fractures; Fractures, Bone; Accidents

Introduction

Maxillofacial trauma is presented as skeletal, dental, and soft tissue (1). Development of abnormalities in the growth of some jawbones, impairments in the temporomandibular (TMJ) joint and occlusion, displacement and degradation of bones, as well as oral deformity plus loss of teeth are among the complications of oromaxillofacial fractures (2). These fractures lead to incidence of severe complications, facial deformity, as well as problems in oral functions (3). The psychological aspects of damage to the oromaxillofacial region are also very important, since facial fractures often cause impaired aesthetics in the injured person (4).

Studies have shown that age and gender are important factors affecting incidence of oromaxillofacial trauma (5-7). The greatest incidence has been observed in the second decade of life, while the lowest has been seen in patients below five years of age and above sixty. The male to female ratio in the world has been reported at 4:1(8).

The main cause of oromaxillofacial fractures worldwide is accidents with motor vehicles, falling, personal fights, and damages resulting from firearms, sports, and occupational accidents (9). These causes may differ given the geographical region, socioeconomic status, as well as cultural characteristics (10). In developing countries, oromaxillofacial fractures mostly occur in response to accidents with motor vehicles (11).

Researchers have examined the incidence and prevalence of oromaxillofacial fractures across different provinces and regions of Iran (12-15). However, since there is no adequate information about the epidemiology of these fractures in Alborz Province, the present research was performed to investigate the frequency of oromaxillofacial fractures in patients hospitalized in Shahid Madani Hospital in Karaj.

Materials and Methods

In this descriptive cross-sectional study, which was performed retrospectively, 749 medical files as well as radiological documents, CT scans, and 3D facial reconstructions related to patients with oromaxillofacial damages available in the archive of Shahid Madani Hospital in Karaj, from 2013 to 2018, were chosen through census method and examined after approval by the Ethics Committee of Alborz University of Medical Sciences, code: IR.ABZUMS.REC.1398.104, also receiving an introduction letter from the head of the dentistry faculty, and receiving permission from the head of the Hospital.

Demographic information was recorded and kept confidential on the information form for every patient, such as age and gender, site of fracture; mandible (condyle, ramus, body, and symphysis), middle face (maxilla, cheekbone, nose, frontal sinus), and dentoalveolar, as well as cause of fracture; accident with motor vehicle, falling, intimate partner violence, sporting event, occupational event, and stumbling. The collected data were analyzed by SPSS 17 software and presented as descriptive statistics (Tables and Figures).

Result

In the present study, 235 patients with oromaxillofacial fracture were studied. Out of the 235 patients, 178 (75.7%) were male and 97 (41.3%) were female. The fracture ratio was 1.8 times higher in men than in women. Most of the injured individuals were young people (54%). The mean age of the patients was 30.96 ± 14.91 years. The minimum and

maximum age of patients was 1 and 90 years old, respectively (Table 1). The total number of fractures was 547. The results of the study indicated that the main fractured oromaxillofacial anatomical regions were mandible (269 cases), maxilla (117 cases), and cheekbone (51 cases). The highest mandibular fracture was observed in the body (48.9) and the lowest in the ramus (11.5) (Table 2).

The results of investigating the causes of fractures in the study patients suggested that in 56.2% of the cases (n = 132) accidents with motor vehicles was the main cause of fractures in the oromaxillofacial region, followed by other accidents including falling from heights (17/4%) and physical disputes (14%) (Figure1).

Table 1. Frequency of maxillofacial fractures in patients' age and gender

anatomic site \ Fractures		Yes n (%)	No n (%)
Mandible	condyle	52(22.1)	183(77.9)
	ramus	27(11.5)	208(88.5)
	Body	115(48.9)	120(51.1)
	symphysis	75(31.9)	160(68.1)
middle face	maxilla	117(49.8)	118(50.2)
	nose	34(14.5)	201(85.5)
	cheek	51(21.7)	184(78.3)
	frontal sinus	30(12.8)	105(87.2)
dentoalveolar		46(19.6)	189(80.4)

Table 2. Frequency of maxillofacial fractures according to anatomic site

demographic data		N	%
Age groups	Child (1-11 years)	17	7.2
	Adolescents (17-12 years)	14	6
	Young (34-18 years)	127	54
	Middle-aged (64-35 years)	73	31.1
	Older (over 65 years old)	4	1.7
gender	Female	97	41.3
	male	178	75.7

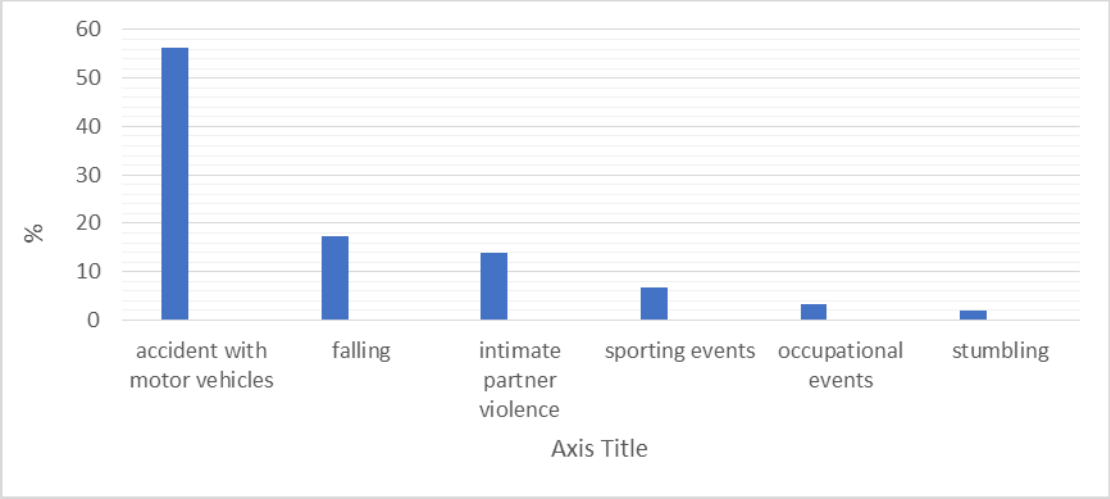

Fig 1. Frequency of maxillofacial fractures in patients according to the causes of fractures

Discussion

In this study, the research sample was chosen from patients hospitalized in one of the Hospital in Karaj, which is one of the important health care centers for different types of oromaxillofacial region fractures in the province, whereby a considerable number of people with such fractures are treated by the experienced health care team of this center.

The results of the present study indicated that the oromaxillofacial region fractures occur twice more frequently in men than in women (2:1 ratio), almost concurring with the results of Lee et al. (16) in Korea and Ellis et al. (17) in Scotland. This figure is low compared to similar studies including those of Kadkhodaie (13) in Rasht (1:12), Al Ahmed et al. (4) in UAE (1:11), and Adekeye (18) in Nigeria (1:16.9).

The higher prevalence of oromaxillofacial injuries in men in the present study has been confirmed in various studies (13, 19-22). This is possibly due to the fact that in many families in Iran men mostly work outside home for generating income for the family, which in turn increases the risk of accidents or violent conflicts (3). In addition, men in Iran mostly drive more than women do, and also participate in battle-involving sports such as soccer and basketball. These men are also more likely than women to consume alcohol and drugs before driving, which all increase the risk of oromaxillofacial fractures (23).

In the present study, most patients (42.3%) were young which is in line with similar studies (1, 4, 12, 14, 24-31). This is possibly due to behavioral, social, economic changes as well as emotional conflicts, mostly occurring in this age group. At these ages, the youth are in the stage of personality independence, social excitement, high activity, recklessness in driving, and participation in physical conflicts (16, 22, 25, 28).

In the present study, the main fractured oromaxillofacial anatomical regions were the mandible, maxilla, and cheekbone. The fractures of facial bones (especially the mandible because of its prognathism in the face) are among the common injuries in patients admitted to hospital emergencies rooms (32). The incidence of maxillofacial fractures in the mandible, in this study, concurred with most similar studies (14, 24, 27, 28, 30, 31, 33, 34). The damages to oromaxillofacial region are among the most common injuries caused by accidents (35). In the present study, accidents with motor vehicles (58.8%) was the most common cause of fracture, which is in line with the results of other studies conducted in Iran (12, 14, 15, 36) and in other countries (29, 37, 38). However, the studies performed in Finland (39) and Australia (20) indicated that violent conflicts and daily activities are the most important causes of maxillofacial trauma. The large difference between the frequencies of fracture inducing accidents, in this study, compared to other causes can be due to poorer adherence to safety principles such as neglecting to use safety belts or helmets by drivers, and not taking driving rules seriously. Observing safety principles can considerably reduce the incidence of accidents (16). Incompleteness of some medical files of patients was the main limitation.

Conclusion

The results of the present study indicated that maxillofacial fractures are mostly common in men and the youth, and mostly occur in the mandible, maxilla, and cheekbone, with the main cause of these fractures being accidents. Planners, policymakers, private and

governmental companies should take measures to correct the infrastructures, promote rules and regulations, and train citizens by way of more educational programs and media advertisements in order to reduce the rate of accidents and their undesired consequences.

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