

## Original Article

# Distribution assessment of maxillofacial fractures in trauma admitted patients in Yazd hospitals: An epidemiologic study

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## ABSTRACT

**Background:** Fracture, is discontinuity of anatomical bone relations. Commonly, a maxillofacial fracture occurs after trauma but the etiology and pattern of this entity is different amongst countries. The aim of this study was to clarify the main causes of this entity in Yazd to increase public and professional awareness to prevent more injuries and subsequent consequences.

**Materials and Methods:** This retrospective cross-sectional study consisted of 194 patients admitted in public hospitals in Yazd, Iran. Variables such as age, gender, cause of accidents, site of fracture and treatment method were noted and recorded in a questionnaire filled during hospitalization of these patients. Causes of accident were classified by 6 reasons such as accident by car and motorcycle, fighting and violence, falls, sports and occupational injuries. The site of fractures, including mandible, maxilla, nasal, frontal and orbital were considered. The data were analyzed using descriptive analysis.

**Results:** The results showed that maxillofacial fractures are more prevalent in male than females (69% versus 31%). The Most sites of fractures were nasal bone (79%). The majority of people with maxillofacial fractures were in the age ranged between 20-29 years and the main reason of maxillofacial fractures was motorcycle accident.

**Conclusion:** According to our result, most sites of fractures were in nasal bone. The main cause of maxillofacial fractures was motorcycle accident. However, in each age range the most common cause of accident was different.

**Key Words:** Mandible, maxilla, maxillofacial fracture, nasal bone, trauma, zygoma

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## INTRODUCTION

Fracture, is discontinuity of anatomical bone relations. Generally, maxillofacial fractures occurs after trauma and can be alone or associated with other injuries. The etiology and pattern of these fractures are various in different countries.<sup>[1]</sup> The most causative factors including traffic accidents, disputes, falls, sports injuries, occupational injuries

and manner of social life are different amongst countries.<sup>[2]</sup> Factors such as manner of social life, use of vehicles, more usage drug and alcohol, widespread urban violence, dangerous sports can increase the incidence of trauma events. Fortunately, the use of safety helmets and technology advances lead to safer vehicles and decrease in such injuries.<sup>[1,3]</sup> Previous studies have shown that most patients suffering trauma are male and in third decade of their life.<sup>[4-6]</sup>

Maxillofacial fractures can be classified according to mandibular, nasal bone, zygomatic and maxillary fractures.<sup>[6]</sup> Mandibular fractures include: Simple, compound, comminuted complicated, greenstick, pathological and impacted fractures.<sup>[6]</sup> Also, it can be arranged by site of fractures such as alveolar, condyle,

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coronoid, body of mandible, angle of mandible and symphysis fracture.

According to the pattern of fracture and muscle attachment, displacement of fracture segments can occur.<sup>[6]</sup> Maxillofacial fracture directly or indirectly can cause infection of nasal cavity, maxillary sinus, eye and brain abscess that deserves more consideration by specialist.<sup>[6]</sup> Maxillary fractures can be classified as: Horizontal, pyramidal and transverse fractures.

When a facial fracture occurs, rehabilitation and reconstruction of the injured structures are of utmost importance. The goals of facial fractures' treatment are rapid improvement of bone status, vision, chewing, talking and providing a favorable condition to revive function, esthetics and patient beauty.<sup>[7]</sup> To achieve these goals, in addition to following principal rules of fractures' treatment, in facial bones regardless of the type of fracture, the first step is to put teeth in proper occlusion to minimize patients' inability of nutrition and enhance patient comfort.<sup>[8]</sup>

The aim of this study was to clarify the main causes of maxillofacial fractures in Yazd, Iran to increase public and professional awareness and knowledge for preventing more injuries and subsequent consequences.

## MATERIALS AND METHODS

Statistical population of this retrospective cross-sectional study included 194 patients has been admitted in Yazd public hospital, Iran. In this study variables such as age, gender, cause of accident, site of fracture and method of treatment were recorded in a questionnaire.

Accident causes were classified as follows: Car and motor accident, fight, violence, land erosion, damage to sports and physical abuse. Also, site of fractures such as mandible, maxilla, and zygoma, nasal, frontal and orbital was considered. For these patients, open and close reduction treatment had been considered.

After collection of all questionnaires, data were analyzed by SPSS software with descriptive analysis.

## RESULTS

One hundred and ninety four patients selected for this study (69% male and 31% females) with age range between 20 to 29 years [Tables 1 and 2]. According

to our result, most sites of fractures were in nasal bone (79%) [Table 3].

Fractures reasons in Yazd city respectively was: Motorcycle accident with 45%, car accident 26%, falls 20%, sports injuries 8%, argument and dispute 1%. After evaluating causes of maxillofacial fractures, the most frequent cause of injuries were motor cycle accidents (45%) [Table 4].

Also, majority of people who had fractures were in the age group 20-29 years and the main cause of fractures in them was motorcycle accident. However,

**Table 1: Frequency distribution of patients based on gender**

Sex	Number	Percentage
Male	134	69
Female	60	31
Total	194	100

**Table 2: Frequency distribution of patients based on age group**

Age	Number	Percentage group
0-9	33	17
10-19	56	29
20-29	69	35
30-39	15	8
40-49	14	7
50-59	2	1
60-69	3	2
70-79	2	1
Total	194	100

**Table 3: Frequency distribution of patients based on site of fractures**

Site of fracture	Number	Percentage
Mandible	21	11
Maxilla and zygoma	11	5
Nasal	154	79
Frontal	8	5
Total	194	100

**Table 4: Frequency distribution of patients based on cause of fracture**

Cause of fracture	Number	Percentage
Car accident	50	26
Motorcycle accident	87	45
Argument	2	1
Fall	39	20
Sports injuries	16	8
Abuse	0	0
Total	194	100

the most common cause of accident was different in each age group [Tables 5-9].

## DISCUSSION

Epidemiological studies in any society are increasing the quality of life. Comparing our results with other studies showed that damage to the mandible is more in the world but in Yazd, nasal bone fracture is more prevalent (79%).<sup>[9,10]</sup> This difference may be related to more motor accident in Yazd city. In Ahmad<sup>[1]</sup> *et al.* in Sharjeh, the most common fractures were reported mandibular fractures with 51% prevalence.

**Table 5: Frequency distribution of patients based on type of treatment**

Type of treatment	Number	Percentage
Close reduction	169	87
Open reduction	25	13
Total	194	100

The most incidences of maxillofacial fractures were in 20-29 age groups. Similar study in Nigeria reported most incidence in age group with 21-30 years and in Ahmad study with 20-29 years.<sup>[1,11]</sup>

Statistical difference for gender was like other studies that the fracture incidence in male was 2 times more than female.<sup>[1,8,9,12]</sup>

The most common causes of maxillofacial fracture in Yazd was according to following descending order: The most reasons related to the motorcycle accident with 45%, car accident 26%, falls 20%, sports injuries 8%, argument and dispute 1%. World reported region of high risk group were 21-29 years old people similar to our results but exceptionally, in Yazd, injuries under 10 years age was much more than other part of the world, so more attention should be paid in this age group.

## CONCLUSION

According to our result, most sites of fractures were

**Table 6: Cause of fracture distribution based on gender**

Cause of fracture	Car accident		Motor accident		Argument		Fall		Sports injury		Abuse		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender														
Male	27	20	70	52	2	1	23	18	12	9	0	0	134	100
Female	23	38	17	28	0	0	16	27	4	7	0	0	60	100
Total	50	26	87	45	2	1	39	20	16	8	0	0	194	100

**Table 7: Cause of fracture distribution based on age group**

Cause of fracture	Car accident		Motor accident		Argument		Fall		Sports injury		Abuse		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender														
0-9	8	24	7	21	0	0	16	48	2	7	0	0	33	100
10-19	15	27	25	45	0	0	8	14	8	14	0	0	56	100
20-29	14	20	42	61	1	1	6	9	6	9	0	0	69	100
30-39	5	33	7	47	0	0	3	20	0	0	0	0	15	100
40-49	6	43	6	42	1	7	1	7	0	0	0	0	14	100
50-59	0	0	0	0	0	0	2	100	0	0	0	0	2	100
60-69	0	0	0	0	0	0	3	100	0	0	0	0	3	100
70-79	2	100	0	0	0	0	0	0	0	0	0	0	2	100
Total	50	26	87	45	2	1	39	20	16	8	0	0	194	100

**Table 8: Site of fracture distribution based on gender**

Site of fracture	Mandible		Maxilla and zygoma		Nasal		Frontal		Total	
	N	%	N	%	N	%	N	%	N	%
Gender										
Male	14	10	8	6	104	78	8	6	134	100
Female	7	12	3	5	50	83	0	0	60	100
Total	21	11	11	6	154	79	8	4	194	100

**Table 9: Site of fracture distribution based on age group**

Site of fracture	Mandible		Maxilla and zygoma		Nasal		Frontal		Total	
	N	%	N	%	N	%	N	%	N	%
Age group										
0-9	4	12	1	3	27	82	1	3	33	100
10-19	4	7	2	4	50	89	0	0	56	100
20-29	11	16	4	6	50	72	4	6	69	100
30-39	1	7	2	13	12	80	0	0	15	100
40-49	1	7	1	7	10	71	2	14	14	100
50-59	0	0	1	50	1	50	0	0	2	100
60-69	0	0	0	0	3	100	0	0	3	100
70-79	0	0	0	0	1	50	1	50	2	100
Total	21	11	11	6	154	79	8	4	194	100

in nasal bone. The main cause of maxillofacial fractures was motorcycle accident. However, in each age range the most common cause of accident was different. Result of our study, confirmed that facial fractures varies from one region to another and knowing these reasons helps prevent and treat these injuries.

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