

A Cross-Sectional Study of Mandibular Fracture in Southern Iran: 1997-'98

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Abstract

Background: The fracture of the mandible is the second most common facial bone injury. When this injury occurs, it could be serious with complications that may even result in death.

Objective: To evaluate the current trends in mandibular fracture (MF) in southern Iran.

Methods: In a cross-sectional study, several parameters including age, sex, cause of fracture, anatomical site of fracture, presenting symptoms and signs of patients and associated injuries were determined in 162 patients with facial bone injuries referring to Khalili Hospital, the referral center in Shiraz, southern Iran. 51 of 162 patients had sustained 77 independent lines of fractures in their mandibles.

Results: The greatest number of mandibular fractures occurred in patients aged between 11 and 30 years with male/female ratio of 5.25/1. Motor vehicle accident was found to be the leading etiological factor (39.1%) followed by falls (33.3%) and violence (21.5%). Fracture of the condyle of mandible was the most frequently type of fracture followed by fracture of the body, angle, symphysis, parasymphysis, alveolar region, coronoid process and ramus. Approximately, 40% of the studied patients also suffered from injuries to other body organs, most commonly to their eyes, limbs and brain.

Conclusion: The epidemiology of mandibular fracture in our region is far different from other reports.

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Keywords • Mandibular fractures • motor vehicle accident • injury

Introduction

Mandibular fracture (MF) is the second most common facial fractures. It is most prevalent in males, aged 12-30 years. Among common causes of MF are violence, motor vehicle accidents (MVAS) sport-related accidents and falls from heights, to name a few.⁴

Determination of the type of MF and associated fractures of adjacent areas is of utmost importance in the management. No reliable statistical data are available on MF from Iran. However, considering the life style, social and cultural differences between different societies it is mandatory to have a study regarding this topic.

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Table 1: Distribution of mandibular fractures according to their sites									
Sites of fracture	Alveolar Process	Body	Symphysis	Parasymphysis	Angle	Ramus	Condyle	Coronoid Process	Total
Number	3	17	7	6	13	2	26	3	77
percent	3.8	22	9	7.7	16.8	2.5	33.7	3.8	100

Patients and Methods

In a cross-sectional study (1997-98), all patients with facial injury and probable MF who referred to the Emergency Ward of the Khalili Hospital in Shiraz, southern Iran were studied. A specially designed questionnaire was used for collecting relevant information. Data collection was continued to gather at least 50 patients with MF. This group included also those cases of MF who suffered from other associated facial fractures (*i.e.*, of nose, maxilla, *ect*). Out of 162 patients with different facial bone fractures, 51 proved to have MF. Diversity of data such as age, sex, symptoms, cause and site of fracture were collected which were compared to those from other reports.

Results

Motor vehicle accidents was the most common cause of the MF in our study with mandibular condyle being the most common site fractured (Table 1).

Familiarity with presenting signs of MF has a key role in its diagnosis and treatment. Malocclusion and trismus were the most common signs observed in our patients (Table 2). Twenty-one patients suffered also from injuries to other parts of their bodies, with the eyes being the most frequently involved site followed by extremities and brain.

Table 2: Presenting signs among the patients with mandibular fracture		
Signs	Frequency	Percent
Malocclusion	43	84.3
Trismus	43	84.3
Gringival ecchymosis	21	41.1
Stepping	20	39.2
T.M joint tenderness	16	31.3
Mucosal laceration	11	21.5
Skin laceration	11	21.5
Drooling	8	15.6
Others*	12	23.4

* Malodor breath, active bleeding, and tooth loss

Discussion

In this study, the most afflicted patients aged between 11 and 30 years. This finding is almost in agreement with previous reports.^{3,5-8} The only considerable observed difference was that of the age group <10 years; the frequency of MF in this age group was 21.5% contrasting the figure of 4.4% reported by Rowe and Khalili.⁹ This might be explained by different games children play in these communities as fractures in 8 of our patients belonging to this age group were due to fall.

We found that men were affected more than women (M/F=5.25/1). Other reports also indicated a similar observation.^{2,3} However, this ratio varies considerably from country to country.^{6-8,10-13} This difference should be sought in social, cultural and economical structures of different societies. In most developing countries men are more involved in extra-residential activities, due to their role in supporting the family's economy in contrast to women who are more limited to their residence which naturally exposes them less to the risks of acquiring this sort of fracture than men. A comparison between M/F ratios in India (8/1)⁷ as a developing country, with those of New Zealand (3/1) and Austria (2.5/1), as two developed countries may help us to clarify the situation better.^{6,7,12} Considering the current course of socio-economical development in our region, our observation of an M/F ratio of 5.25/1 which stands somehow between those earlier-mentioned extremes, seems to be logical.

In our study the three most frequent causes of MF were motor vehicle accidents (MVA) in 39%, falls in 33%, and violence in 15% of patients. There are also notable differences among different countries as to the order of the most frequent causes of MF (Table 3).

The predominance of MVA in our region could be attributed to several factors. Limited availability of public transport facilities such as trains, subways and airplanes forces people to use roads as almost the sole means of their traveling. In our area, the safety precautions such as using seat belts, helmet, *etc*, is almost frequently overlooked by people, as it was the case in all our patients. People in general, do not adhere to the laws of driving in an appropriate manner. These might explain the

Table 3: The most frequent causes of mandibular fracture in different countries

Country	Causes according to the order of their frequencies
Tanzania	Violence, motor vehicle accidents, falls
Zimbabwe	Violence, falls, motor vehicle accidents
Senegal	Violence, falls, motor vehicle accidents
Nigeria	Violence, falls, motor vehicle accidents
Libya	Motor vehicle accidents, Violence
India	Motor vehicle accidents, violence
Japan	Motor vehicle accidents, falls
England	Violence, falls, motor vehicle accidents, sports related accidents
(Manchester)	
Austria	Sports related accidents, motor vehicle accidents, falls
New Zealand	Violence

difference observed between our country and that of a developed country where adherence to the governing rules for driving and better utilization of safety facilities causes the MVA not be the most frequent cause of MF.

Falls follows MVA as the second most common cause of MF. This observation is in agreement with reports from other countries. Violence which is the most frequent cause of MF in many countries occupied the third place in our study. Besides the socio-cultural differences, widespread alcohol consumption in those societies may be an important factor.

In the current study, mandibular condyle was the most frequent site of fracture (Table 1). The distribution of fracture sites in our study is in agreement with what is reported by Kasey and Weber.¹³ However, the observed variation in sites of fractures among different countries, might be a reflection of the causative factor.

The most common presenting signs (Table 2) were trismus and malocclusion (Table 2). This is reasonable considering that mandibular condyle, body, and the angle of mandible were the most common sites afflicted. Twenty-one (40%) of our patients also suffered from injuries to other parts of their bodies, including eyes, limbs, and brain. As it is noticed earlier, patients with associated injuries comprised a considerable proportion of our studied sample. Here again, MVA as the most prevalent

cause of MF, could explain the high frequency of observed associated injuries in our patients.

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