



## Spectrum of Mandibular Fractures in a Tertiary Care Hospital at Karachi

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### Significance:

The maxillofacial areas are one of the most frequently fractured sites. With the mandible existence especially commonly affected due to its relative protuberance as associated with the rest of the facial skeleton. The management of these fractures is a task requiring skill and experience. In the repair of maxillofacial trauma, functional and aesthetic reconstruction is major concern. This study evaluated the frequency of mandibular fractures related to age, gender, etiology, and site in the last five years.

### ABSTRACT

**Objective:** To evaluate the frequency, pattern, and etiology of mandibular fractures at a tertiary care hospital, in Karachi

**Study Design:** Retrospective, cross-sectional study.

**Setting:** Abbasi Shaheed Hospital, Karachi, Pakistan

**Methodology:** The study was initiated in Outpatient Maxillofacial Surgery Department of Abbasi Shaheed Hospital Karachi. The duration of the study was 5 years and six months. Data of mandibular trauma was evaluated. In this retrospective, cross-sectional study the patients were recruited through convenience sampling and the inclusion criteria was patients from both genders suffered from mandibular trauma of mandibular region. Patients who suffered from the trauma of face other than mandible were excluded. The sample size of the study was 464. A questionnaire was designed to enquire into the demographic details like age, sex, etiology, and site of fracture. The data was analyzed on SPSS version 17.0.

**Results:** The majority of patients were males i.e. 384 (82.8%) while 80 (17.2%) were females. The most common type of fracture was combination fractures followed by parasymphysis i.e. 142 (30.6%) and 79 (17%) respectively. Road traffic accident was the major cause of trauma i.e. 332 (71.6%) followed by fall 96 (20.7%). Cross tabulation was done between different variables. Association of gender with etiology and type of fracture revealed non-significant p-value while the association of age with etiology revealed significant p-value. The highest number of mandibular fracture cases due to RTA were reported in the year 2019.

**Conclusion:** It has been concluded that the frequency of mandibular trauma is quite high with male dominance. The most susceptible site of trauma is the combination and parasymphyseal region and the most common etiology were road traffic accidents.

### Introduction

The maxillofacial areas are one of the most frequently fractured sites. With the mandible existence especially commonly affected due to its relative protuberance as associated with the rest of the facial skeleton. The management of these fractures is a task requiring skill and experience. In the repair of maxillofacial trauma, functional and aesthetic reconstruction is our first concern. (1) These injuries can diverge in severity ranging from minor soft tissue injuries to major fractures of the whole facial skeleton. Fracture is not ever left ignored because it is very painful, pain that deteriorates with mastication and phonation movements, and even respiratory movements; sometimes there are facial asymmetry complaints. Mandibular fractures are informed to have an incidence of 15.5% to 59% amongst facial trauma worldwide and are the second most common facial fractures presenting to the emergency department. (2) The large inconsistency in reported incidence is due to a variety of contributing factors such as gender, age, environment, and socio-economic status of the patient as well as the mechanism of the injury. The most fortunate site of fracture (in descending order) in mandible are the body, angle, condylar region, symphysis, and coronoid process. (3, 4) Mandibular fractures may ensue alone or in combination with additional facial and skeletal bones. The etiology of mandibular fractures could be caused by road traffic accidents, accidental falls, assaults, industrial mishaps, sports injuries and firearm injuries. (5) Current trends in the management of mandibular fractures are, firstly, intermaxillary fixation only by dental wiring, arch bars and gunning splints. Also, intermaxillary fixation with osteosynthesis by transosseous wiring, circumferential wiring and external pin fixation. And, osteosynthesis without intermaxillary fixation by miniplates, non-compression plates, compression plates and lag screws. (6, 7)

Many studies have been done to evaluate the pattern and spectrum of mandibular fractures in different cities of Pakistan. (8, 9 and 10) The purpose of this study is to evaluate the frequency of mandibular fractures related to age, gender, etiology, and site in the last five years. This study also highlights the precautions to be taken in the prevention of mandibular fractures.

### Materials and Methods

The study was initiated in the Outpatient Maxillofacial Surgery Department of Abbasi Shaheed Hospital, Karachi, Pakistan. The duration of study was six months and data of last 5 years was

evaluated. In this retrospective, cross-sectional study the patients were recruited through convenience sampling and the inclusion criteria was patients of any gender suffered from mandibular trauma of facial region. Patients who suffered from the trauma of face other than mandible were excluded.

The sample size of this study was 464 although a minimum sample size of 377 was calculated by Raosoft software with a confidence level of 95%, the margin of error 5% and response distribution of 50%. A questionnaire was designed to enquire into the demographic details like age, sex, etiology, and site of fracture. The data was analyzed on SPSS version 17.0. Quantitative variables were calculated as mean and standard deviation. Qualitative variables like gender, the pattern of trauma, etiology were calculated as percentage. Chi-square test was used to evaluate the association of gender with pattern and etiology of trauma. p- value of < 0.05 was considered significant.

**Results:**

The results of the study revealed that the mean age was 27.24+13.564. The majority of patients were males i.e. 384 (82.8%) while 80 (17.2%) were females. (Figure 1)

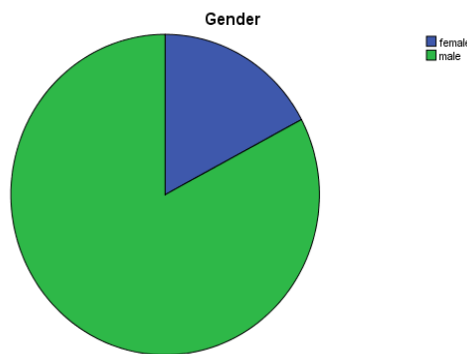


Figure 1: Percentage distribution of gender

The most common type of fracture was combination fractures followed by parasymphysis and condyle i.e. 142 (30.6%), 79 (17 %) and 75 (16.2 %) respectively (Figure 2).

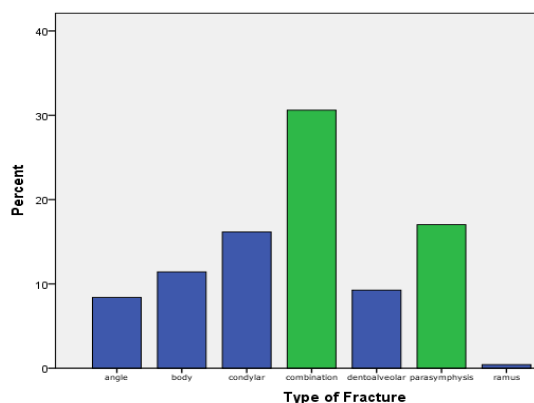


Figure 2: Percentage distribution of type of fracture

Road traffic accidents were the major cause of trauma i.e. 332 (71.6%) followed by fall 96 (20.7%) and assault 26 (5.6%). (Table 1)

Table 1: Percentage of Etiology of Mandibular Fractures

Etiology	N (%)
Assault	26 (5.6%)
Fall	96(20.7%)
Gunshot	2 (0.4%)
Road traffic accident	332(71.6%)
Sports	8 (1.7%)
Total	464 (100%)

Cross tabulation was done between different variables. Association of gender with etiology and type of fracture revealed non-significant (p= 0.537, p= 0.673) while association of age with etiology revealed significant p-value (p < 0.001) (Table 2)

Table 2: p- value of Different Variables of Mandibular Fractures

Variable	p- value
Gender and etiology	0.537
Gender and type of fracture	0.673
Age and etiology	0.139
Age and type of fracture	0.000

The highest number of mandibular fracture cases due to RTA were reported in the year 2019 followed by 2015 and 2018. (Figure 3)

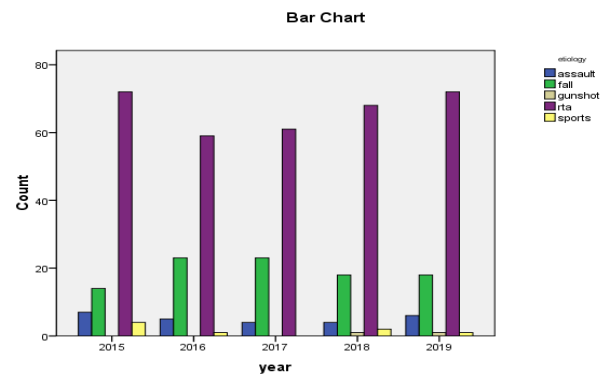


Figure 3: Yearly Distribution of Etiology of Mandibular Fractures

**Discussion**

The facial region is considered as one of the prone trauma sites among the human body. Amongst the face, mandible becomes the most susceptible site. (11) The results of this study revealed that the mean age was 27.24 ± 13.564. The majority of patients were males i.e. 384 (82.8%) while 80 (17.2%) were females. This is almost similar to the study conducted at Mayo Hospital Lahore, revealed that most patients were males (80%) and mean age was 26 ± 16.09. (12) Another study conducted at Abbasi Shaheed Hospital revealed that males constitute the

highest proportion of trauma victim especially mandibular fractures. (13) A retrospective analysis at maxillofacial trauma at a tertiary center in North West Ethiopia also revealed that males were 80% victims and their mean age range was  $29.12 \pm 8.62$  years and the maximum age range of 21-30 years. (14)

The most common type of fracture was combination fractures followed by parasymphysis and condyle i.e. 142 (30.6%), 79 (17 %) and 75 (16.2 %) respectively. While a cross-sectional retrospective study conducted at Southern Taiwan revealed that condylar neck and head were the most common sites (32%) followed by the parasymphysis (21.7%), symphysis (19.5%), angle and ramus (17.5%) and body (9.3%). (15) In an epidemiological survey of mandibular fractures in Caracas (Venezuela) evaluated the incidence and its combination patterns showed that the parasymphysis region was the most common location of mandibular fractures with 144 (27.6%) fractures. (16)

A road traffic accident was the major cause of trauma i.e. 332 (71.6%) followed by fall 96 (20.7%) and assault 26 (5.6%). In a study published in 2014, by Elina M. Peltola, revealed that motor vehicle accident becomes the major cause of trauma among 374 patients. (17) A similar study conducted at Botucatu Medical College Clinical Hospital concluded that automobile accidents were the major cause which especially leads to multiple fractures of facial bones. (18) Another study also revealed similar results. (19) Association of gender with etiology and type of fracture revealed non-significant p-value while the association of age with etiology revealed significant p-value. Logically evaluating gender does not have a significant part as accidents can occur anywhere and anytime without discriminating the gender and may affect any region of the facial area. While age has a strong relationship with trauma because the mean age in our study is  $27.24 \pm 13.564$  with a wide range of standard deviation specifically in the male gender. This is similar to the study conducted at Jizan, KSA. (20)

The majority of males in this age group were motorbike riders and this youth of our population was frequently involved in reckless driving and one wheeling and prone to RTAs. The limitation of the study was a cross-sectional, retrospective study design.

It is recommended that awareness programs, talks, and seminars should be planned and executed to develop driving sense among the population. Strong implementation of traffic rules should be planned and drivers should be asked to strictly follow the vehicle driving regulations. Roads and bridges should be repaired, cleaned and constantly monitored for proper driving of the vehicles. Further studies should be planned in order to follow up with the patients.

### Conclusion

It has been concluded that the frequency of mandibular trauma is quite high with male

dominance. The most common reported were combination fractures followed by parasymphyseal region fractures and the most common etiology was road traffic accidents.

**Conflict of interest:** Authors do not have any conflict of interest to declare.

**Disclosure:** None

**Human/Animal Rights:** No human or animal rights are violated during this study.

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