**Epidemiological Pattern of Mandibular Fracture in A Tertiary Care Hospital**

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**Abstract**

**Objective:** To determine the epidemiological pattern of mandibular fracture in a tertiary care hospital.

**Study design:** Cross sectional Descriptive Case Series.

**Place and duration of study:** This evaluation of epidemiological pattern of mandibular fracture was carried out at Oral and Maxillofacial Surgery Department, Bibi Aseefa Dental College, Shaheed Mohtarma Benazir Bhutto Medical University Larkana, Sindh from the period of April 2014 to April 2015.

**Materials and Methods:** To analyze epidemiological aspects of mandibular fractures for assessment of variables such as etiology, distribution, and anatomical site of mandibular fractures among patients of maxillofacial injuries. A total of 102 patients were included in this study. Demographic profile, etiological factors and management modalities were assessed.

**Results:** The result shows that males in age group of 21–30 years (42.6%) were in majority. ParaSymphysis was fractured in 35.3% patients, 33.3% had fracture of body of mandible, symphysis, 7.8% and ramus in 6.9%. The majority of the patients of road traffic accidents had fracture of ParaSymphysis. ParaSymphysis was fractured in 31.4% in age group of 20–30 years, body of mandible was fractured in 14.7% in age group of 31–40 years and in age group of > 50 years, 2.9% had fracture of ramus and angle of mandible.

**Conclusion:** Present study reveals that male in age group of 21–30 years are frequently inflicted with mandibular fracture. The most common cause of mandibular fracture was road traffic accidents followed by interpersonal violence and fall. ParaSymphysis is the most common site of fracture.

**Keywords:** Facial Injuries, Mandibular Fracture, Road Traffic Accidents, Etiology.

**Introduction**

The morbidity associated with mandibular bone fracture is both functional and esthetic as well causing severe pain during mastication and phonation movements and in some cases during respiratory movements too. Therefore,
it is mandatory to arrive an accurate timely diagnosis and institute treatment required.

Since ancient times, mandibular fractures remained a matter of great significance due to risk associated with incurring trauma in facial injuries which has been described up to 23 to 95%. Mandible, being the only mobile bone of facial skeleton and more prone to trauma and fracture due to fact of being an embryologically a membranous bone. The epidemiological investigations have been conducted in various countries and in Pakistan as well. The variations in results of these studies are due to cultural and legislative practices. In developing countries, road traffic accidents are the leading cause accounting for about 60-80% of the cases, interpersonal violence causes about 10-20% cases, fall was found in 5-10% and sports and other causes accounted for lesser frequency. In developed countries a paradoxical situation has been observed where interpersonal violence and sports are leading causes of maxillofacial injuries. Gender distribution of mandibular fracture has universal pattern in which majority of the causalities are most frequent in male adults of age group 20 to 30 years.

**Materials and Methods**

This was a cross sectional descriptive study which was carried out in the Department of Oral and Maxillofacial Surgery at Bibi Aseefa Dental College, Shaheed Mohtarma Benazir Bhutto Medical University Larkana, Sindh from the period of April 2014 to April 2015. All consecutive patients attending Oral & Maxillofacial Surgery Department were included in this study. Data on etiology of injury, site of fracture, demographic profile and treatment modalities were recorded and assessed. The patients with history of facial trauma were included in this study. After seeking consent from the patient or from attendant of patient. After clinical examination and confirmation of site of fracture of mandible, and after confirmation of management modality of the fracture, structured questionnaire was filled. The data were analyzed by SPSS Version 21.0. The categorical data was calculated by expressing frequencies and percentage and numerical data was analyzed by mean and standard deviation. Chi-square was applied to express association with p-value at 0.05.

**Results**

In this study, out of total 102 patients, 5(5.9%) were less than 20 years, the majority of the patients were in age group of 20-30 years which comprised of 42.2%, in age group of 31-40 years, 20.6% of the study population were recorded, in age bracket of 41-50 years 23.5% were found to be inflicted by mandibular fracture and in age group of more than 50 years only 8.8% were recorded. The statistical analysis of the site of mandibular fracture and age group was done to find out the relevance of site of fracture with age group; this analysis shows the majority of the subjects in age group 20-30 years, 32 patients suffered fracture of mandible at ParaSymphysis, in age group of 31-40 years, body of mandible was the commonest site and similarly in age group of 41-50 years, commonest site was body. While in two extremes of age bracket of less than 20 years and more than 50 years, the sites of fracture were different than other groups i.e. in age group of less than 20 years Symphysis was the common site of fracture and in age group more than 50 years, body and angle were the common sites of fracture by applying Ch-Square test of significance.

Etiological variables were statistically analyzed which show interesting inferences; overall road traffic accidents caused fracture in 63 individuals, road traffic accidents caused fracture of ParaSymphysis in 30 subjects, while 15 patients of RTA had fracture of body of mandible. Intrapersonal fight caused fracture in 23 patients, out of these patients 10 patients suffered fracture of body of mandible and 8 had fracture of angle region. Fall caused fracture in 11 patients, out of them fracture of body of mandible was found in 4 individuals and one at angle of mandible as shown in table I.

<table>
<thead>
<tr>
<th>Site of Fracture</th>
<th>RTA</th>
<th>Intrapersonal Fight</th>
<th>Fall</th>
<th>Other</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symphysis</td>
<td>06</td>
<td>03</td>
<td>01</td>
<td>-</td>
<td>10</td>
<td>0.001</td>
</tr>
<tr>
<td>Parasympsis</td>
<td>30</td>
<td>02</td>
<td>05</td>
<td>-</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>15</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Angle</td>
<td>05</td>
<td>08</td>
<td>1</td>
<td>-</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Ramus</td>
<td>07</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>23</td>
<td>11</td>
<td>5</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

P<0.05 was taken as level of significance

In age group of 20-30 years, 31.4% were recorded with fracture of parasympsis, 5.4% had fracture in body of mandible, the highest number of patients in age group of 31-40 years, 14.7% had fracture of body of mandible and...
10.8% of the patients in age group of 41-50 years had fracture of body. Figure 1.

**Figure1. Anatomical Sites**

<table>
<thead>
<tr>
<th>Site</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symphysis</td>
<td>35.3</td>
</tr>
<tr>
<td>Parasymphysis</td>
<td>33.3</td>
</tr>
<tr>
<td>Body</td>
<td>20.0</td>
</tr>
<tr>
<td>Angle</td>
<td>10.8</td>
</tr>
<tr>
<td>Ramus</td>
<td>11.8</td>
</tr>
<tr>
<td>Other</td>
<td>4.9</td>
</tr>
</tbody>
</table>

**Discussion**

Among maxillofacial fractures, the reported prevalence of mandibular fracture is 36% to 59%. This variation of prevalence is due to some attributable variables like cultural, legal i.e. enactment of traffic rules, age and gender differences. Most of the studies reveal that Symphysis and coronoid process are the most frequent sites of mandibular fractures. This pattern is not in accordance to our results but being a developing country in Pakistan, traffic rules are not followed so incidence of traffic accidents are common leading cause of higher prevalence of mandibular fractures. Motor cycle accidents are very much common where use of helmet is very sparse.

Among all patients, 42.2% patients were in age group of 20 to 30 years which is the highest number among all patients, 20.6% were in age group of 31-40 years of age. The most common site of fracture in age group of 31-40 years was body of mandible accounting for 14.7% while ParaSymphysis was 3.9%. In a retrospective study by KiranS et al in India who assessed the pattern of maxillofacial injuries revealed that 86.5% of cases were caused by road traffic accidents and second common cause of injury was fall, the incidence was higher in male and the effected patients were in age group of 30 to 40 years. The results obtained from this study show that the most frequent site of fracture was ParaSymphysis accounting for 31.4%, body of mandible in 24.5% and Symphysis in 3.9%. The association of site of mandibular fracture with etiology had no significant variation, as the most common fractured site is ParaSymphysis followed by body and condyle showing the relation of site of fracture with point and intensity of impact rather that the etiological factor. Bormann KHI et al, while reviewing retrospectively the cases of mandibular fractures in Germany found 32% of patients sustained mandibular fracture due to road traffic accidents the cause of 28% cases was due to intrapersonal violence and 26% due to falls. The mandibular condyle was the most common site.

A study in Peshawar by Ahmed et al revealed that incidence of mandibular fracture was most frequent in age group of 21 to 30 years while most common cause of fracture was road traffic accidents accounting for 42.6% while 28% were injured by fall and third common cause was firearm injury which has not been reflected in our study. The firearm injuries could be explained due to possible presence of terrorism in KPK province of Pakistan. The common site of fracture was ParaSymphysis (27.4%) followed by angle (23.3%) and body (22.2%) in the study subjects. A prospective study was carried out by KH lee et al, who reviewed record of 1045 patients of maxillofacial surgery, which revealed 90% males and the majority were in age group of 15-29 years(64%),most common cause of fracture was sports accounting for 16%,fall for 13% and road traffic accidents were responsible for only 10% of the cases; this is in contrast with findings of our study where majority of the cases were reported to be caused by road traffic accidents. According to studies, the most common cause of mandibular fracture in developing countries varies, to a greater extent, from developed countries. Where interpersonal violence and sports are the leading causes while in developing countries, the most common cause of mandibular fracture is attributed to road traffic accidents. Brade D et al, in their study about patterns of mandibular fractures in India found that 79% subjects were males and most common age group comprised in age bracket of 21-30 (37.5%). The most frequent cause was road traffic accidents which accounted for 68.8%, fall was found in 16.8% and interpersonal assault resulted mandibular fracture in 11% among the study subjects. The site of trauma was assessed among these patients which were 41% at ParaSymphysis, condyle in 29% and angle was fractured in 26%. Ogunmuyiwa SA et al conducted a study in Nigeria which showed a 4: 1 ratio between male and female patients where majority of the patients were in age group of 21-39 years. Pandey S et al found 89% of the maxillofacial fractures were recorded in male patients, about 40% of the patients were in age group of 21-30 years. The most frequent cause of mandibular fracture was road traffic accidents. These studies in developing countries are similar to results of our study. The sites involved were mandibular fractures, maxilla and zygoma in 33, 7%, 31% and 24% respectively.
In a study by Taiwo AO et al.18, the epidemiological pattern of facial fractures in Nigeria indicated 95% male patients were injured, while the age group who inflicted fracture were in 21-30 years of age. Out of these patients 52% had mandibular fracture, and 36% had fracture of Zygomaticomaxillary region.—Treatment provided was mandibulomaxillary fixation.

### Conclusion

The evidence reflected by present study reveals that male subjects in age group of 21-30 years are frequently inflicted with maxillofacial injuries. The most common cause of mandibular fracture is road traffic accidents followed by interpersonal violence and falls. The distribution of anatomical sites involved are body and Symphysis region. This assessment of the etiological factors, demographic profile and extent of all the maxillofacial injuries help in planning preventive strategies and to reduce the number and severity of such injuries. This study will also be useful in assessing current requirements of maxillofacial service and for formulation of planning to reduce and manage patients with maxillofacial trauma.

### References