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Original ARTICLE

Evaluation of prevalence and pattern of mandibular fractures in a known population

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ABSTRACT
Background: The etiology and pattern of mandibular fracture vary considerably among different study populations. Despite many reports about the incidence, diagnosis and treatment of mandibular fracture there is limited knowledge about the specific type or pattern of mandibular fractures. **Material and method:** A total of 120 patients were enrolled in this study who had reported to the maxillofacial surgery department of the dental college with a presentation of maxillofacial fractures and had received treatment for the same. All the demographic details of the patients were recorded from the hospital data. The cause, extent and pattern of fractures were also recorded from the clinical records of the patients. The radiographic records of the patients were also collected. Patients were divided into two age groups: Group1: Age between 18-35 years, Group 2: Age between 36-50 years. **Results:** In the current study it was seen that out of 120 cases of maxillofacial fractures there were 53 cases of mandibular fractures comprising of 44.14% of the total fractures. 37 out of 53 cases of mandibular fractures were seen in males whereas 16 out of 53 cases of mandibular fractures were seen in females. 75.47% cases of mandibular fractures were seen in the younger age group of 18-35 years. Dentoalveolar fractures were the most common type of mandibular fractures comprising of 33.96% of total mandibular fracture cases. **Conclusion:** Mandibular fractures are one of the most prevalent amongst the maxillofacial fractures. Among the mandibular fractures dentoalveolar fractures are the most common. These fractures are mostly seen in the young male population.
Key words: Maxillofacial fracture, Mandible, Dentoalveolar

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INTRODUCTION

The maxillofacial region is one of the most commonly fractured sites of the body. The management of these fractures is a challenge requiring skill and experience. In repair of maxillofacial trauma, functional and aesthetic reconstruction is a prime concern[1]. Mandible is the second most commonly fractured bone after nasal bone, though it is the largest and strongest facial bone. Mandibular fractures can involve only one site or can often involve multiple anatomic sites simultaneously[2-4].

Mandibular fractures are the most frequent type of fracture in the maxillofacial region. Mandibular fractures may occur alone or together with other facial bone fractures. The predicted ratio of mandible to zygomatic to maxillary bone fractures in patients experiencing maxillofacial injury is 9:4:1[5]. The mandible is particularly prone to maxillofacial trauma because of its unique shape, mobility, and prominence in the facial skeleton. It is the second most common facial bone experiencing traumatic injuries, accounting for 15.5%-59% of all facial fractures[6].

A clearer understanding of the demographic patterns of mandibular fractures will assist providers of healthcare as they plan the treatment of maxillofacial injuries. Such epidemiological information can also be used to guide the future funding of public health programs geared towards prevention of such injuries[7]. Hence, this current study was undertaken to evaluate the prevalence and pattern of mandibular fractures in a known population.

MATERIAL AND METHOD

This retrospective study was undertaken to evaluate the prevalence and pattern of mandibular fractures in a known

population. A total of 120 patients were enrolled in this study who had reported to the maxillofacial surgery department of the dental college with a presentation of maxillofacial fractures and had received treatment for the same. All the demographic details of the patients were recorded from the hospital data. The cause, extent and pattern of fractures were also recorded from the clinical records of the patients. The radiographic records of the patients were also collected. Patients were divided into two age groups: Group1: Age between 18-35 years, Group 2: Age between 36-50 years. Patients with missing or incomplete clinical or radiographic records were excluded from the study.

All the data was collected and recorded in the Microsoft excel sheets. SPSS software was used for statistical analysis. Student t test and chi square test were applied to find out the level of significance. P-value of less than .05 was considered significant.

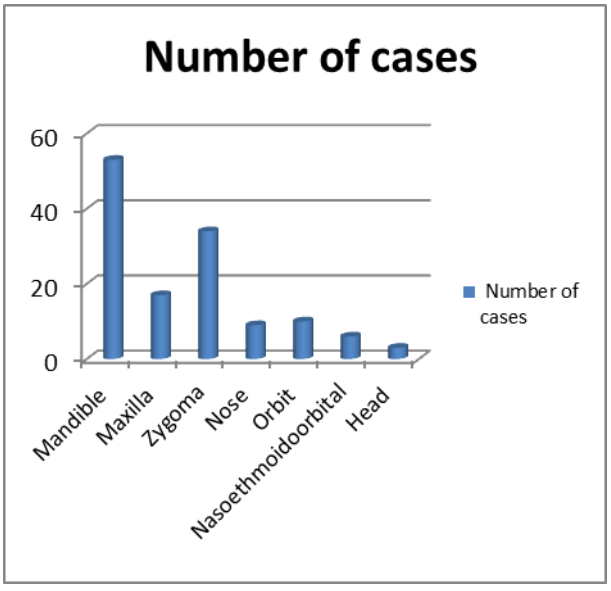
RESULTS

In the current study it was seen that out of 120 cases of maxillofacial fractures there were 53 cases of mandibular fractures comprising of 44.14% of the total fractures. Zygomatic fractures were second most prevalent with 34 cases amongst 120 total fracture cases. The distribution of fractures of other facial bones was illustrated in table1 and graph 1.

Table 1: Distribution and prevalence of fractures

Fracture site	Number of cases	Percentage
Mandible	53	44.14%
Maxilla	17	14.16%
Zygoma	34	28.33%
Nose	9	7.5%
Orbit	10	8.33%
Nasoethmoidoorbital	6	5%
Head	3	2.5%

Graph 1: Graphic representation of distribution and prevalence of fractures.



The current study observed that mandibular fractures were mostly seen in male patients. 37 out of 53 cases of mandibular fractures were seen in males whereas 16 out of 53 cases of mandibular fractures were seen in females. Younger age showed greater incidence of mandibular fractures. 75.47% cases of mandibular fractures were seen in the younger age group of 18-35 years (table 2).

Table 2: Demographic correlation with mandibular fractures

Variable		Number of cases	percentage
Gender : Male		37	69.81%
	Female	16	30.18%
Age :	**18-35 years**	40	75.47%
	36-50 years	13	24.52%

The current study observed that dentoalveolar fractures were the most common type of mandibular fractures comprising of 33.96% of total mandibular fracture cases. Second most common type of mandibular fractures was parasymphysis fractures accounting for 24.52% of all mandibular fracture cases. The pattern of mandibular fractures was elaborated in table 3.

Table 3: Pattern of mandibular fractures

Site	Number of cases	percentage
Symphysis	3	5.6%
Parasymphysis	13	24.52%
Body	4	7.5%
Angle	6	11.32%
Ramus	3	5.6%
Condyle	6	11.32%
dentoalveolar	18	33.96%

It was observed in this study that males of the younger group reported with majority of the mandibular fracture cases but both the gender correlation and the age correlation with the fractures pattern was not significant statistically (table 4).

Table 4: Correlation between the gender and age with the site of fracture

Site	Gender		Age	
	Male	Female	18-35 years	36-50 years
Symphysis	2	1	3	0
Parasymphysis	10	3	11	2
Body	3	1	2	2
Angle	3	3	4	2
Ramus	2	1	1	2
Condyle	4	2	4	2
Dentoalveolar	13	5	15	3
P-value	0.63		0.79	

DISCUSSION

Maxillofacial (MF) injuries constitute one of the major health problems worldwide. Although these injuries are common worldwide, their patterns vary in different societies. Specific interest is directed to the incidence and variety of these injuries[8]. MF fractures are often associated with substantial morbidity, deformity, loss of function, and high treatment cost[9]. The etiology and pattern of mandibular fracture vary considerably among different study populations. Recent overall shift in the mechanism of injury and age distribution of patients sustaining these injuries are well-documented. There is reported variability in the pattern of mandibular fractures resulting from different causes of injury, such as road traffic accidents (RTAs), assaults, and falls[10].

Ill-treated or wrongly treated mandibular fractures culminating to significant functional and esthetic emanation including facial

asymmetry, malocclusion, temporomandibular joint disorders (TMJDs), and osteomyelitis. The age distribution of individuals sustaining craniomaxillofacial injuries differs from one country to another. Conventionally, there has been a high male-to-female ratio among craniomaxillofacial injury victims, ranging from 10:1–6.6:1. However, the recent literature shows a trend toward a more equal male-to-female ratio[11].

In the current study it was seen that out of 120 cases of maxillofacial fractures there were 53 cases of mandibular fractures comprising of 44.14% of the total fractures. Zygomatic fractures were second most prevalent with 34 cases amongst 120 total fracture cases. The distribution of fractures of other facial bones was illustrated in table1 and graph 1. Juergen Andreas Zix et al described epidemiological trends of mandibular fractures in Switzerland. A special emphasis was directed towards the potential impact of socio-economic standards on the mechanism and pattern of mandible fractures. A database of patients aged over 16 years who had been diagnosed with a mandibular fracture between January 2000 and December 2007 at the University Hospital of Bern, Switzerland's largest Cranio-Maxillofacial-Surgery Centre, was retrospectively reviewed. Patients' data including gender, age, mechanism of accident, fracture site and associated injuries were analysed and compared with previously published data. There were a total of 420 patients with 707 mandibular fractures. The two most common causes of injury were road traffic accidents (28%) and various types of sports injuries (21%). A total of 13% of the patients were under the influence of alcohol or drugs at admission. Fractures were predominantly situated in the condyle/subcondyle (43%) and in the symphysis/parasymphysis region (35%). Occurrences of fractures in the angle and in the body were low, at 12% and 7% respectively. In contrast to other highly developed countries, sports- and leisure-related accidents outnumbered motor vehicle accidents and altercations. The data presented here supports the assumption of a correlation of trauma cause and fracture pattern[12].

The current study observed that mandibular fractures were mostly seen in male patients. 37 out of 53 cases of mandibular fractures were seen in males whereas 16 out of 53 cases of mandibular fractures were seen in females. Younger age showed greater incidence of mandibular fractures. 75.47% cases of mandibular fractures were seen in the younger age group of 18-35 years (table 2). Arif Rashid at al retrospectively evaluated mandibular fractures in patients who presented to a London teaching hospital between June 2005 and May 2010. A total of 1261 patients sustained 1994 mandibular fractures (mean 1.6, range 1-5). The incidence of mandibular fracture was higher in male patients (87%) than in females (13%) (male:female ratio 6.6:1), and the peak incidence was during the third decade for both genders. The most common site of fracture was the angle (30%), followed by the parasymphysis (27%), and condyle (27%). Overall, interpersonal violence was the most common cause (72%) followed by falls (18%). In male patients, the most common cause was interpersonal violence (77%); in females it was a fall (46%). The anatomical sites of fracture reflected their cause. Interpersonal violence typically resulted in fractures of the angle (36%) while road traffic accidents and falls resulted in condylar fractures (28% and 53%, respectively). A total of 66 (5%) patients sustained other maxillofacial fractures and 37 (3%) presented with non-maxillofacial fractures. Our findings are consistent with trends reported in other urban centres[13].

The current study observed that dentoalveolar fractures were the most common type of mandibular fractures comprising of 33.96% of total mandibular fracture cases. Second most common type of mandibular fractures were parasymphysis fractures accounting for 24.52% of all mandibular fracture cases. The pattern of mandibular fractures were elaborated in table 3. It was observed in this study that males of the younger group reported with majority of the mandibular fracture cases but both the gender correlation and the age correlation with the fractures pattern was not significant statistically (table 4). Saurab Bither et al documented the pattern and incidence of mandibular fractures occurring in rural population, at Rural Dental College and Hospital, Maharashtra, India. A retrospective analysis of patient records and radiographs for the 5-year period from January 2003 to December 2007 was conducted. Data were identified and analyzed based on age group, gender distribution, anatomic location, and cause of injury. A total of 324 patients with 486 injuries were reviewed, males formed 80.9% and females 19.1% of the studied population, with peak incidence occurring in the 21-30 years age group. The most common fractures site was parasymphysis (39.3%). The etiology of mandibular fractures was road traffic accidents (42.9%), followed by falls (25.9%), assaults and interpersonal violence (20.7%), and animal injuries (10.5%). Our results exhibit that road traffic accidents remain the major cause of mandibular trauma and animal injuries being found exclusively in rural population. There is a variation of incidence and pattern of maxillofacial trauma from region to region[14].

CONCLUSION

From the above study the author concluded that mandibular fractures are one of the most prevalent amongst the maxillofacial fractures. Among the mandibular fractures dentoalveolar fractures are the most common. These fractures are mostly seen in the young male population. Further studies are recommended.

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