

Pattern of Mandibular Fracture at Rims, Imphal, Manipur: A Retrospective Study

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Background:

In the maxillofacial skeleton, mandible is commonly fractured due to its prominent position and the pattern of mandibular fractures varies from one place to another. The objective of this retrospective study was to analyze the patterns of mandibular fractures in RIMS, IMPHAL, MANIPUR with similar studies in rest of the world.

Patients and methods:

The data were collected from the records of patients who reported in Department of Emergency and General Practice and in Department of Oral and Maxillofacial Surgery, DENTAL COLLEGE, RIMS IMPHAL, MANIPUR between 2016 and 2018. The site of fractures, age and sex of patient, etiology of trauma, monthly variation were analyzed.

Results:

Records of 86 patients sustaining mandibular fractures were analyzed. Males were most commonly involved then females. Maximum patients were under the age group of 21-30 years. The main etiological factor was road traffic accidents. The most commonly fractured site of mandible was parasymphysis.

Conclusion:

There is variation of patterns of mandibular fractures from one region to another. Further research should be encouraged in this field and amendments in traffic legislation are to be made to decrease the incidence of mandibular fractures.

Key words: Pattern, Mandibular fractures, Retrospective study

Date of Submission: 12-09-2020

Date of Acceptance: 29-09-2020

I. Introduction

Various published studies show that the pattern and incidence of maxillofacial fractures are changing over the decades and is different in various countries. Main etiologies worldwide are road traffic accidents (RTA), interpersonal violence falls and sports related injuries, although the frequency and causes differs from one country to another because of social, cultural and environmental factors.^[1,2] Of all, RTA remains the most frequent cause of maxillofacial injuries in developing countries.^[3] Mandible, being prominent in the maxillofacial skeleton, is commonly fractured.^[4] The frequency of fracture of the mandible, zygomatic complex and maxilla has been reported in the ratio of 6:2:1 and mandibular fractures comprise most of the traumatic injuries treated by an oral and maxillofacial surgeon.^[5] The aim of the study is to analyze retrospectively the age and sex distribution, etiology, location of mandibular fractures and monthly variation in a sample of patients from Dental College, RIMS, Imphal, Manipur between 2011 and 2013 and compare the results with similar studies.

II. Material and Methods

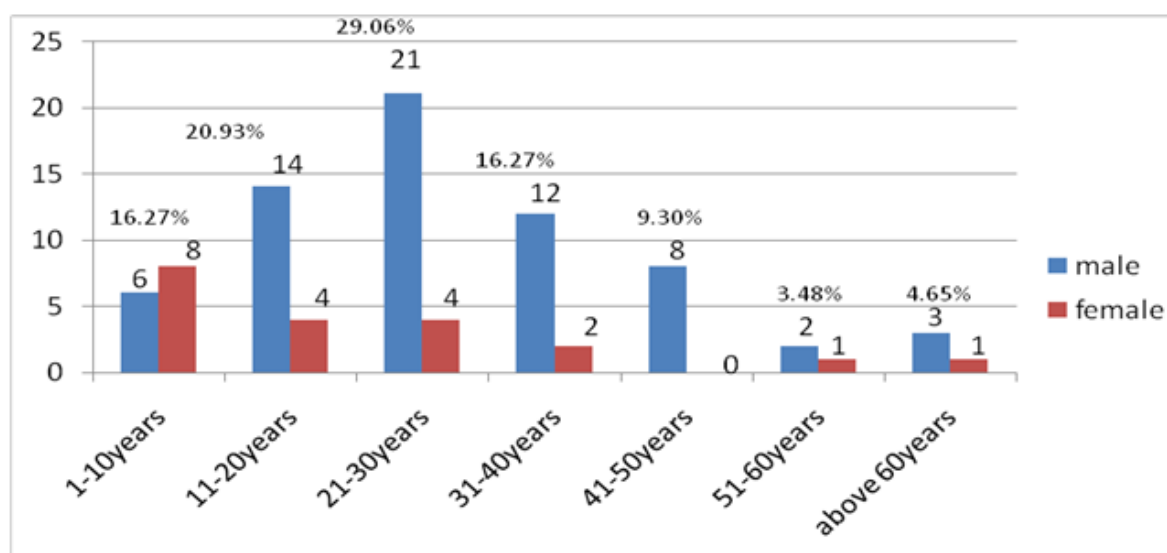
All cases with mandibular fractures, who reported to department of emergency and department of oral and maxillofacial surgery, DENTAL COLLEGE, RIMS, IMPHAL, MANIPUR over a period of 3 years, between 2016 and 2018 were included in the study. The data were classified under: age of the patient; gender; etiology; monthly variation and anatomic location of fracture. The fractures of the mandible were classified anatomically into seven regions namely: condyle, coronoid, ramus, angle, body, parasymphysis, symphysis and dentoalveolar regions. The ages of the patients were classified into different age groups such as 1-10 years, 11-20 years, 21-30 years, 31-40 years, 41-50 years, 51-60 years and above 60 years. All patients whether admitted or treated as outpatients were included in the study. Postoperative infected fracture cases were not included in the study. Patient with extensive head injuries, infections and pathologies like cyst were not included in the study. Orthopantomography (OPG), postero-anterior view, lateral oblique view, CT face (if required) was carried out to determine fracture diagnosis. Patient information was collected on basis of well documented in patient and out patient records and radiographs.

III. Results

Age Wise Distribution of study subjects

During a 3-year period, 86 patients reported with 124 types of mandibular fractures. The age of patients at the time of injury ranged from 1-73 years, with a mean age of 27.27 years. In most cases the patients were between 21-30 years (n=25; 29.06%). The least no of patients were in age group 51-60 years (n=3, 3.48%)

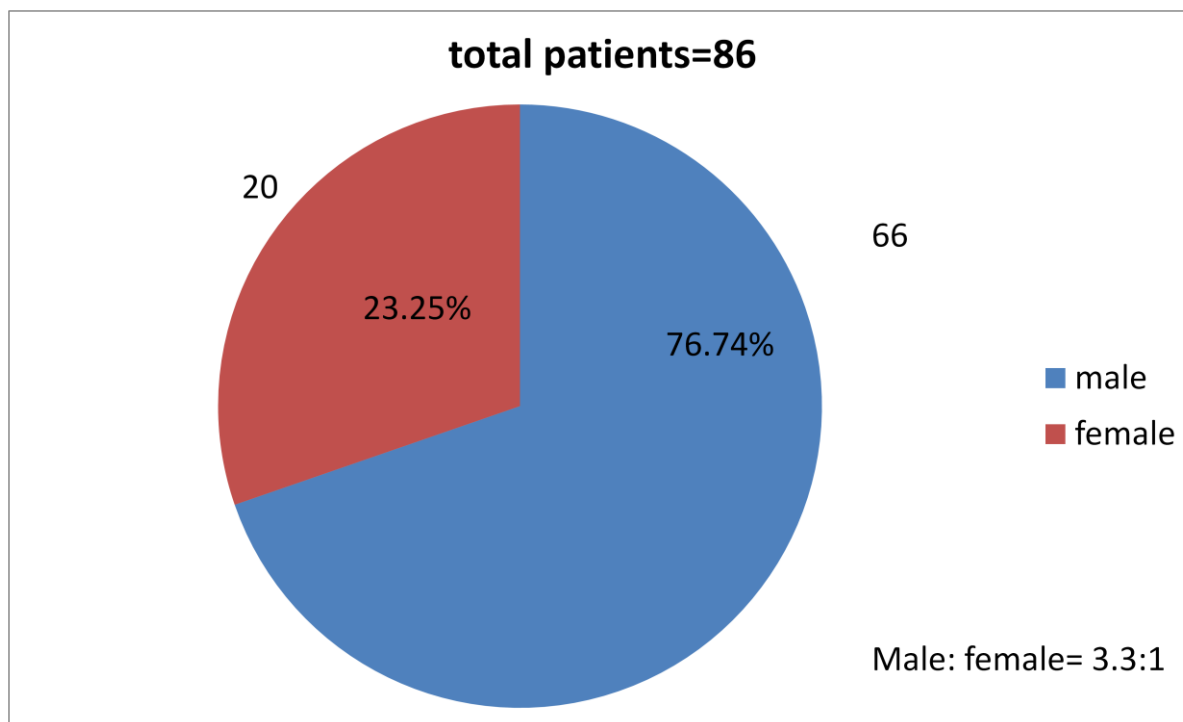
Age groups	No.	male	female	%
1-10years	14	6	8	16.27%
11-20years	18	14	4	20.93%
21-30 years	25	21	4	29.06%
31-40years	14	12	2	16.27%
41-50years	8	8	0	9.30%
51-60years	3	2	1	3.48%
Above 60years	4	3	1	4.65%



Sexwise Distribution of Study Subjects

Most of the patients were males (n=66, 76.74%). Only (n=20, 23.25%) patients were female. The male to female ratio of the patients was 3.3:1.

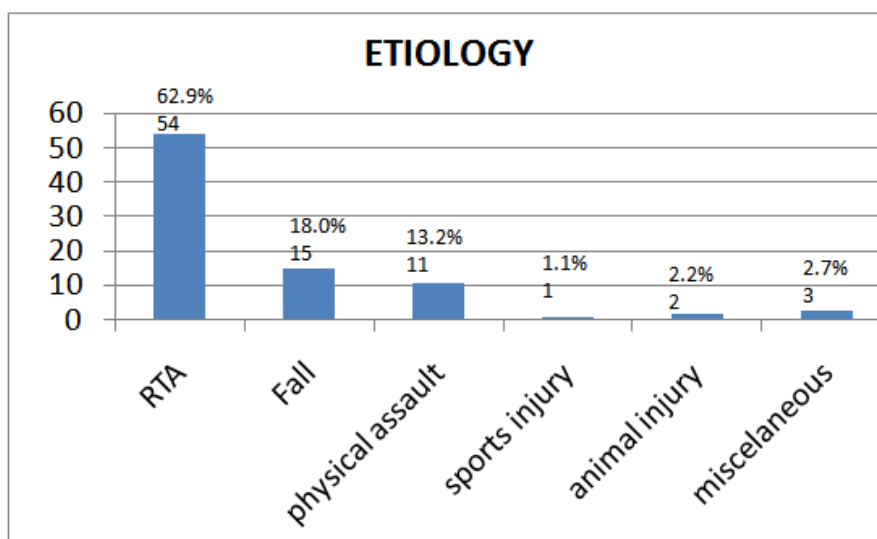
S.N.	Sex	No.	%
1.	male	66	76.74%
2.	female	20	23.25%
	total	86	100%



Etiology-wise Distribution of Study Subjects

Road traffic accident (n=54,62.9%) was the cause of mandibular fractures in majority of subjects, followed by fall from height (n=15, 18.0%), physical assault (n=11, 13.2%), animal injury (n=2, 2.2%) and sports injury (n=1, 1.1%).

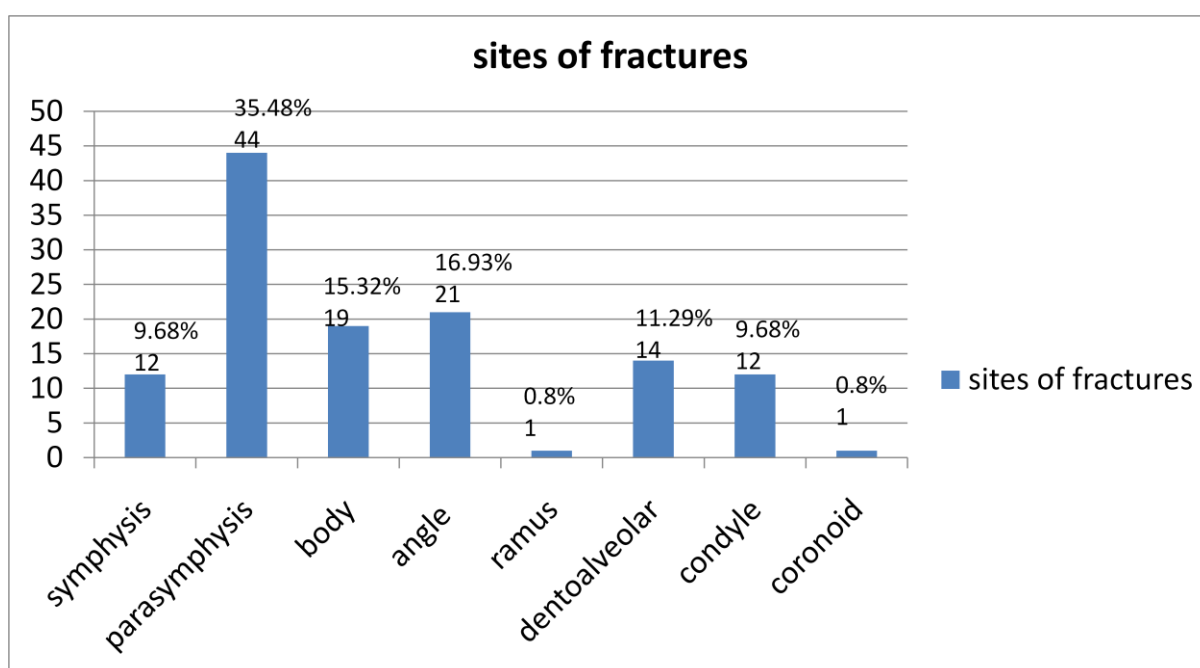
Mode of injury	No.	%
a. RTA	54	62.9%
b. Fall	15	18.0%
c. Physical assault	11	13.2%
d. Sports related injuries	1	1.1%
e. Animal injuries	2	2.2%
f. Miscellaneous	3	2.7%
Total	86	



Site of Mandibular Fractures

Out of total 86 patients, there were 124 different types of mandibular fractures. Fracture of parasymphysis(35.48%), body (15.32%), angle (16.93%), dentoalveolar (11.29%), symphysis (9.68%) and condyle (9.68%) were the most common sites while fracture of coronoid (0.80%) and ramus (0.80%) were the least common fracture sites.

S.N.	sites of fractures	No.	%
1	symphysis	12	9.68%
2	parasymphysis	44	35.48%
3	body	19	15.32%
4	angle	21	16.93%
5	ramus	1	0.80%
6	dentoalveolar	14	11.29%
7	condyle	12	9.68%
8	coronoid	1	0.80%
	Total	124	

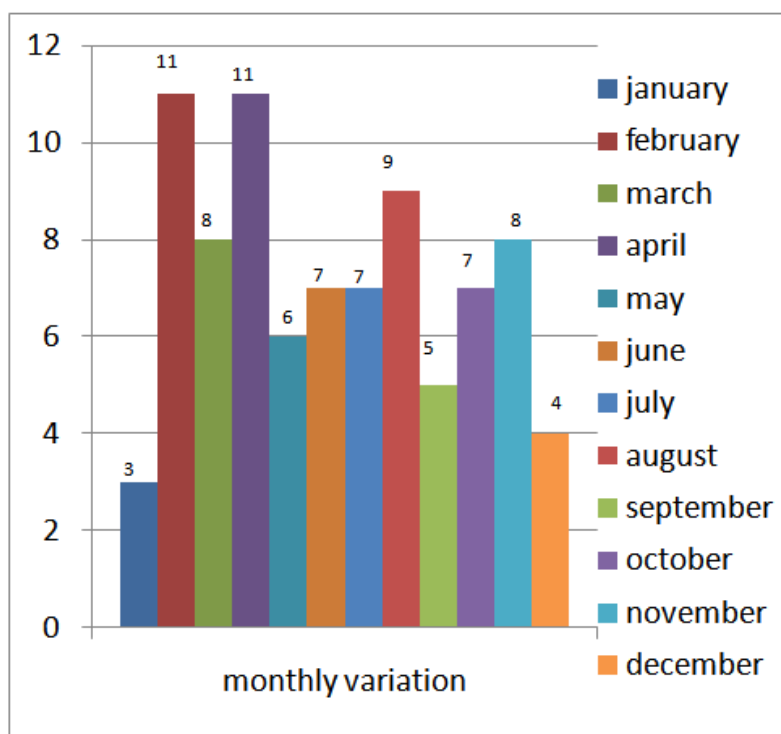


Month wise distribution

The monthly incidence of mandibular fracture was fairly constant. The largest number was in February (n=11,12.79%) and April (n=11,12.79%) and least in January (n=3, 3.48%)

Month	No.	%
January	3	3.48%
February	11	12.79%
March	8	9.30%
April	11	12.79%
May	6	6.97%
June	7	8.13%
July	7	8.13%
August	9	10.46%

September	5	5.81%
October	7	8.13%
November	8	9.30%
December	4	4.65%
Total	86	



IV. Discussion

Different studies on the incidence and etiology of maxillofacial fractures tend to vary from one country to another because of the differences in social, cultural, and environmental factors.^[6]

In this study, the male to female ratio shows (3.3:1) that the fracture mandible is predominantly common in the male population in this region. This finding is consistency with results of previous studies conducted all over the world. ^[4, 7, 8] The relatively high number of male to female is due to the fact that male are engaged more in outdoor activities while the female are confined to indoor activities

In the present study, the predominant age group having mandibular fractures was 21-30 years (29.06%); these findings are consistency with the results of previous studies ^[4, 9, 10, 11] but contrast with the study of Karyouti SM ^[12] who reported that the age group 0-5 is mostly affected. The second and third decades of human life are the most active decades in life and thus people in these decades are vulnerable to trauma. These age groups show more activity in sports, fights, violent activities, industry and high speed transportation. The low frequencies of very young and old age groups are due to the low activities of these age groups.

Previous epidemiological studies reported road traffic accidents followed by fall as the leading cause of mandibular fractures in developing countries.^[4,7,13] Consistent with the findings of previous investigations, road traffic accidents(62.9%) followed by fall(18.0%) were frequent cause of jaw fracture in this study.

However, in developed countries, assaults and interpersonal violence are the leading etiological factors.^[11,14] The world health organization has estimated that nearly 25% of all injury fatalities worldwide are a result of road traffic crashes, with 90% of the fatalities occurring in the developing world. Alcohol as a causative factor is generally recognized being a prominent contributing factor in fights and traffic accidents.^[7,9] The increasing no. of RTAs in developing countries like Nepal may be attributed to many factors like sharing of roadways by pedestrians and animals with vehicles with almost no segregation between them. Old and poorly maintained vehicles and poor roadways along with alcohol consumption also contribute in many RTAs in this part of world. ^[7]

In our study, the most common site of mandibular fracture was parasymphysis fracture (35.48%). The result is similar with other studies. ^[5,10,15,16] The least common site of mandibular fracture was coronoid(0.8%)

and ramus(0.8%). The result is similar with previous studies. [5,6,10,15,16]The parasymphysis is probably the commonest site due to the presence of permanent tooth buds in the pediatric mandible presenting a high tooth to bone ratio, while in adults it is partly to the length of canine root weakening the structure. The other reason for being the commonest site of fracture is as follows. The bone fracture at site of tensile strain since their resistance compressive force is greater. Mandible being similar to an architectural arch distributes the applied force along its length but not being a smooth curve in a uniform cross-section. There are parts at which force per unit area developed is greater resulting in increased concentration of tensile strength leading to a fracture at the site of maximum convexity of the curvature.

The monthly incidence of mandibular fracture was fairly constant with seasonal variations as reported in several studies.[6,17]The highest incidence of mandibular fracture were seen in February(12.79%) and April(12.79%) and least incidence was seen in January(3.48%).

V. Conclusion

This study revealed that the peak incidence occurred in 21-30 years pointing to the role of social factors such as lack of knowledge, improper attitudes and practices as the underlying causative agents predisposing to mandibular fractures. The most frequent etiology was road traffic accidents followed by accidental fall, and the predominant site of fracture was found in parasymphysis region. Mandibular fractures were almost three times common in males than females. The limitation of the study lies in the small cohort, but it overcomes the hurdle as institute serve as a referral centre to almost entire plains of Imphal district and adjoining. Being a retrospective study, details of other substantial variables like influence of alcohol couldn't be elicited. To reduce the incidence of road traffic accidents, the laws regarding the precautions like seat belts, speed limits and traffic rules must be strictly enforced. Further research work is needed on a large population.

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Dr. Brajbhushan Mall, et. al. "Pattern of Mandibular Fracture at Rims, Imphal, Manipur: A Retrospective Study." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(9), 2020, pp. 31-36.