

Metaanalysis of Mandibular Fractures – Experience of two tertiary care facial trauma units in Assam: 1 year Prospective Study

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I. Introduction

The rise in the incidence of faciomaxillary injuries is a cause of concern for trauma units, plastic & faciomaxillary surgeons and E.N.T surgeons. In 2005, road traffic injuries resulted in the death of an estimated 110 000 persons, 2.5 million hospitalizations, 8–9 million minor injuries and economic losses to the tune of 3% of the gross domestic product (GDP) in India. This is most likely to increase further to 200 000 deaths and more than 3.5 million hospitalizations annually by 2015.¹

The study conducted by Bhuyan *et al* has shown that head and neck (66%) is commonly involved in an accident, followed by upper and lower limb (44% and 41% respectively). Most common injury patterns are head and neck with extremities (45%).² Istomin in his study also described that in road accidents predominant injury sites were head and neck with extremities (35.9%).³ In another study conducted on the faciomaxillary fractures by Mohammad H *et al*, he reported that mandibular fracture constituted 72.9% of the 237 patients examined.⁴

In our study we specifically look into the pattern of mandibular fractures only of faciomaxillary injuries; in Assam, one of the seven north eastern states of India, which had been limping back into normalcy after a decade of militancy. The study was conducted at the Department of E.N.T at the Assam Medical College and Hospital, Dibrugarh and the Guwahati Medical College and Hospital, Guwahati. The study was conducted on the mandibular fracture patients admitted in this department during the period of March 2011 to March 2012.

Aims and Objectives

The following parameters were considered for the study:

- Age and Sex distribution of Mandibular fractures
- Causative factors involved
- Pattern of fractures at different sites of the mandible
- Seasonal and daily variation in mandibular fracture incidence

II. Materials and Methods

A total number of 52 patients with Mandibular fractures who attended the Casualty Departments of ENT, Head & Neck Surgery of Guwahati Medical College, Guwahati and Assam Medical College, Dibrugarh from March 2011 to March 2012 were included in the study.

Other patients with faciomaxillary injuries such as those to middle third of face, zygomatic, nasal, orbital, palatine fractures or fatal injuries were excluded from this study. A proforma with personal information, complete history with clinical symptoms and signs were noted.

Diagnosis was based on clinical and radiological findings. The data was computerized and analyzed using Statistica software.

The etiological factors were divided into road traffic accidents, physical assaults, industrial accidents, falls and miscellaneous causes. The road traffic accidents were analyzed regarding the type of vehicle (bicycle, motor cycle, motor vehicle and pedestrian)

Mandibular fractures were recorded as condylar, coronoid, ramus, angle, body of mandible, parasymphyseal, symphyseal and dentoalveolar fractures.

III. Results and Observations

Age:

In our series the youngest patient was 16 years old and the oldest patient who presented with mandibular fracture was at the age of 65 years. The mean age for this series was 30.90 years. The age group of 21-30 years had the highest number of patients accounting for 48.08% of all the cases. 21.15% of the cases were between the age group of 31-40 years. There were only two patients above the age of 50 years in this series.

Sex:

The males constituted of the major bulk of the patients, accounting for 90.38% of the cases. While there were only 5 female patients encountered during the study period. The male to female ratio was 10:1 for this series.

IV. Age And Sex Distribution

AGE GROUP (in years)	SEX		TOTAL	
	Male	Female	n	%
0—10	0	0	0	0.00
11—20	7	1	8	15.38
21—30	25	0	25	48.08
31—40	10	1	11	21.15
41—50	5	1	6	11.54
51—60	0	1	1	1.92
61—70	0	1	1	1.92
71—80	0	0	0	0.00
>80	0	0	0	0.00
TOTAL	47	5	52	100.00

Cause:

There were variable causes of mandibular fracture in this series, out of which Road Traffic Accidents (RTA) constituted 53.84% of the causes. While 34.61% of the patients presented with mandibular fracture due to assault. There was one patient each of fits and fall who presented with mandible fracture.

Road Traffic Accidents

Total number of RTA cases was 28 of which the motorcycle was the vehicle involved in majority of cases (12) followed by the bicycle (4) and other motor vehicles. Pedestrian accidents caused mandibular fractures in 10 cases.

Influence of Alcohol

Out of the 52 cases of mandibular fractures studied, 31 (59.61%) were found to be under the influence of alcohol during the event. Out of which 19 (67.85%) cases were of RTA and 12 (66.67%) were of physical assault.

Site of Fracture:

Single fracture was found in 38 of the cases (73%), while the rest presented with multiple fractures. Body of mandible fractures (42.3%) and Symphysio-Parasymphysial fractures (40.3%) were found most commonly.

Cause And Site

CAUSE AND SITE	NUMBER (n)	PERCENTAGE (%)
CAUSE:		
RTA	28	53.85
Physical Assault	18	34.62
Industrial	4	7.69
Fall from Tree	1	1.92
Fits	1	1.92
SITE		
Body of Mandible	22	42.31
Ramus	8	15.38
Symphysio-parasymphysial	21	40.38
Condyle	3	5.77

Angle	8	15.38
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V. Discussion

Age

In our study the majority of individuals found to be affected were of the age group 21-30 years that accounted for 48.08%, which is similar to the findings of Mohammed Hossein et al (2003)⁴, who reported 59% cases in this age group. Other studies such as Khaled et al (2006)⁵, Hamad et al (2004)⁶ and Dongas P et al (2002)⁷ have also reported the same population group to be commonly afflicted.

The reason for this can be primarily attributed to the rash and negligent driving of youngsters, without the adequate safety precautions that are not implemented strictly in many developing countries such as ours.

Sex

Out of the 52 cases studied by us, 47 of them (90.38%) were found to be males. Such high disparity was also detected by Bajwa SJ et al (2012) (83.3%)⁸, Hamad et al (2004) (91.6%)⁶, Bolaji et al (2003) (86%)⁹, Mohammed Hossein et al (2003) (89%)⁴ etc.

However Khaled et al (2006) (78%)⁵, Bataineh et al (1998) (75.3%)¹⁰ and Fridrich K et al (1992) (75%)¹¹ detected slightly lower incidence among men.

This high incidence among men is due to the lesser frequency of female drivers in our area, more aggressive nature of male drivers and the tendency of males to drive after consuming alcohol and thus disregarding other traffic regulations and indulging in physical quarrels more.

Cause

The main cause of faciomaxillary injury in our series was found to be due to road traffic accidents (53.8%) followed by physical assaults (34.6%).

Similar high incidence of motor vehicle accidents were detected by Bajwa S J et al (2012) (90%)⁸, C.E Anyanechi et al (2011) (79.9%)¹² and Hamad Ebrahim (2004) (75%)⁶

In contrast, Bolaji et al (2003) (79%)⁹, Dongas P et al (2002) (55%)⁷ and Sojot A et al (2001) (53.5%)¹³ found Interpersonal violence to be the major contributing factor in mandibular fractures.

In the analysis of the type of vehicle involved in most RTAs, the motorcycle was found to be involved in 42.85% of the cases.

And 31 (59.61%) cases were found to be under the influence of alcohol out of which 19 (67.85%) were of RTA and 12 (66.67%) were of physical assault.

The unsuitable driving conditions and reckless, uncontrolled driving by the individuals is accounted for the higher occurrence; whereas in developed nations, the controlled environment of the roads prevents this. There, assaults and contact sports play a greater role in mandibular fractures.



Site

Mandible fractures in our study were found mostly affecting the body (42.3%) followed by the symphyseo-parasymphiseal region (40.3%); ramus and angle fractures were around 15% each.

Similar findings were detected by King R et al (2003)¹⁴ with 35% cases having parasymphiseal involvement, whereas other studies showed angle of mandible fractures to be most common; such as Bolaji et al (2003) (36%)⁹, Khaled et al (2006) (22%)⁵, Fridrich et al (1992) (39.1%)¹¹.

This is due to the contrast in the cause of injury. As the main plague affecting our area is road traffic accidents, the area involved is body and symphyseo-parasymphiseal region of mandible. Whereas in other

studies conducted in better socio-economic conditions, assaults and contact sports such as rugby resulted in higher rate of angle of mandible fractures since accidents are limited there. Also, the use of mouth guard in those areas protects the symphysis to body region of the mandible; leaving the angle and condyle more vulnerable to fracture.

VI. Conclusion

This study revealed that the peak incidence of mandibular fractures occurred in the economically productive 21-30 year age group and the most frequent causative factor encountered was road traffic accidents. The predominant site involved was the body and symphyseo-parasymphyseal region of the mandible.

The health infrastructure of the region was established to deal with the common morbidities as per the national priority like RCH and control of different Communicable diseases. To deal with these morbidities valuable resources of the existing health institution has to be diverted. RTA is another emerging morbidity in a developing state like Assam which is not only siphoning off a large chunk of specialist man hour as well as other valuable resources of the health services. As such to plan the services properly we must have an idea of its magnitude as well as the type of service requirement for those affected by RTA. With this backdrop, the current study was conducted with the objectives of finding out the magnitude of problem, its epidemiological factors and morbidity and mortality pattern due to RTAs in a district of Assam.

This study has many limitations in estimating the burden of RTAs, studying the disease epidemiology, using in policy making but undoubtedly it will help to conduct further research study in this relevant field in the remote area of north eastern region.

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