

The spectrum of maxillofacial injuries recorded in tertiary care centre up

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Introduction

Maxillofacial injuries involve soft and hard tissues injury of the face extending from frontal bone superiorly to mandible inferiorly.

The severity and pattern of maxillofacial injury differ from one geographical area to another or may be within the same area based on prevailing socioeconomic, cultural and environmental factors. Despite of many reports about the incidence of maxillofacial fracture there is limited study about the specific type or pattern of maxillofacial fractures in our region.

Some existing studies observed that in maxillofacial area, the mandible is the most common fracture site, possibly because it is unguarded and has a predominance

position on the face. Some survey also reported the fracture of the mandible (69.2%) outnumbered other facial fractures, but few other reports differed from this observation.¹

Some study reported that the Para symphysis and symphysis fractures were the most common sites of fracture in mandible followed by condylar fractures which coincides with the survey in western Nepal.²Our study attempts to define current, predictable patterns of fracture in central part of Uttar Pradesh.

Purpose

- To develop the reliable and regional data base of maxillofacial injury pattern.

- To develop the useful guide for human resource and logistics for the proper and prompt management of maxillofacial trauma.

Materials and methods

This study is a retrospective analysis of medical records available in trauma Centre. The medical records of

patients with facial trauma treated from July 2018 to May 2019 were observed and reviewed.

We attended a total of 3427 patients of maxillofacial injuries in trauma Centre and 489 patients having bony injuries were managed by our team in trauma unit during the mentioned period of time. Then data were analysed based on the number and anatomic location of fractures.

Observation

Table 1:

Mid face Fracture Site	NO. OF PATIENTS- 187 (38.24%)			Total
	RT	B/L	LT	
Le fort I	13	12	6	31 (6.3%)
Le fort II	8	25	6	39 (7.9%)
Le fort III	5	3	3	11 (2.2%)
ZMC	32	5	39	76 (15.5%)
Isolated nasal	2 (0.4 %)			
Palatal	14 (2.8 %)			
Frontal	5 (1.0 %)			
NOE	9 (1.8 %)			

Table 2:

Mandibular Fracture Site	NO. OF PATIENTS – 243 (49.69%)			
	RT	B/L	LT	Total
Angle	20	1	24	45 (9.20%)
Condyle	22	5	21	48 (9.81%)
Para symphysis	47	11	39	97 (19.83%)
Body	20	03	15	38 (7.7%)
Ramus	4	0	3	7 (1.4%)
Symphysis	08			8 (1.6%)

Table 3:

Multiple fracture site in mandible	NO.
Angle + Symphysis	16 (3.2%)
Condyle +Parasymphysis	20 (4.0%)
Symphysis+Bilateral Condyle	3 (0.6%)
Bilateral parasymphysis	9 (1.8%)
Symphysis + Ramus	2 (0.4%)
Angle + Condyle	2 (0.4%)
Angle + Angle	1 (0.2%)
Condyle + Condyle	3 (0.6%)
Symphysis + Body	3 (0.6%)
Total	59 (12.06%)

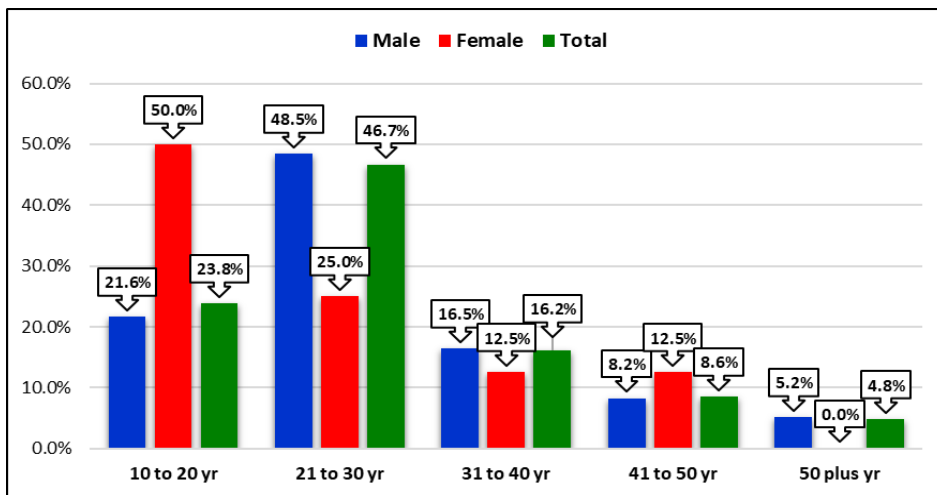
Most common mid face fracture is ZMC (15.5%) followed by Le fort II - (7.9%), Le fort I - (6.3%), Le fort III- (2.2%). Mandible (49.69%) is the most common fracture among the maxillofacial injuries.

In mandible most common fracture site is Para symphysis, (19.83%) (Single site of mandible fracture). In combination fracture the condyle and symphysis fractures (4.0%) were more common followed by angle and symphsealfraction (3.2%).

Table 4:

Age Group	Male		Female		Total	
	No.	%	No.	%	No.	%
10 to 20 yr	21	21.6%	4	50.0%	25	23.8%
21 to 30 yr	47	48.5%	2	25.0%	49	46.7%
31 to 40 yr	16	16.5%	1	12.5%	17	16.2%
41 to 50 yr	8	8.2%	1	12.5%	9	8.6%
50 plus yr	5	5.2%	0	0.0%	5	4.8%
Total	97	100.0%	8	100.0%	105	100.0%

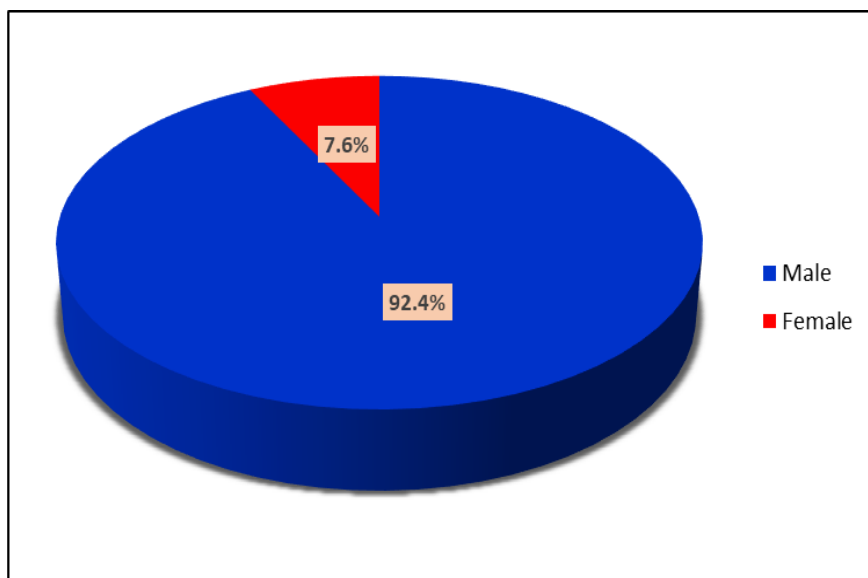
Upon comparing gender undergoing maxillofacial trauma, males are more prone to trauma, mainly because of more intoxication habits found among males & more exposure of males to outer world as compared to females. Maximum number of patients were found between 21 to 30 years of age group (48.5%) among males, as compared to 10 to 20 years (50.0%) in females.



As we can see in this table, maximum number of trauma was found in 21 to 30 years (46.7%) of age group among general population, & least number present in 50 years & further (4.8%).

Table 5:

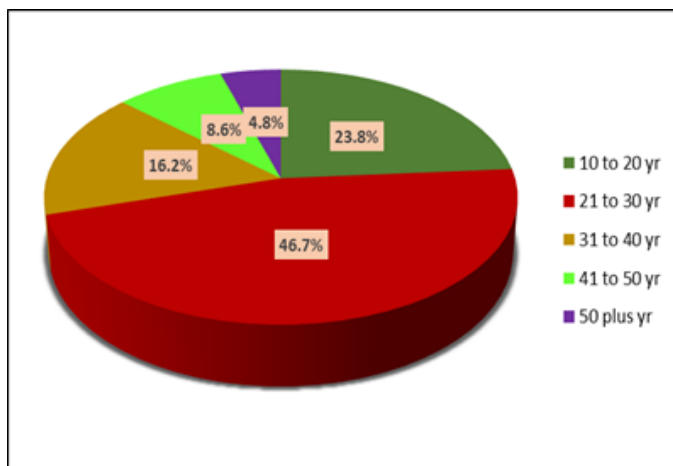
Sex	Total	
	No.	%
Male	97	92.4%
Female	8	7.6%
Total	105	100.0%



Seeing total percentage of trauma, 92.4% males reported to our unit with maxillofacial trauma, whereas, only 7.6% females reported with maxillofacial trauma.

Table 6:

Age Group	Total	
	No.	%
10 to 20 yr	25	23.8%
21 to 30 yr	49	46.7%
31 to 40 yr	17	16.2%
41 to 50 yr	9	8.6%
50 plus yr	5	4.8%
Total	105	100.0%



Only comparing the age group of reported patients, 46.7% of patients belonged to 21 to 30 years of age group, & least number of patients were from 50 years & plus age group(4.8%).

Discussion

Trauma registries are a potential source of the data needed for comprehensive public health surveillance of injuries. Our trauma Centre is a tertiary care Centre and deals with patients from all over UP by round the clock. This Centre provides very vast and variety of patients which can be used as indicators to improvise the quality of treatment offered thereby indirectly improving the quality of life. Good quality, reliable and representative information is very vital and is the foundation to formulate injury prevention programs in India.

There are lot of area specific diversity in data, as some study reported the mandibular fractures were the most common among all other sites⁵. However, this is not

corresponding with other studies that found that nasal bones and zygomaticomaxillary complex the most common site of fractures due to their prominent position within the facial skeleton⁶. Michael Krimmel et al, reported that mandibular angle region with an impacted third molar is an area of lowered resistance to external forces.³

In our study the demographic data was also recorded and we found that the peak incidence of maxillofacial trauma are at 20-30-year age group and least in over 60-year group and the gender distribution was recorded for six-month period with male: female ratio 8.9:1.

Some previous study also reported the peak incidence of maxillofacial fractures in the age group of 21-30 years

(36.2%) followed by the age group of 31-40 years (26.3%), which shows that, in general, young people suffer more from trauma compared to older population⁶. This is admissible that the 30-40 years age group performs the most energetic period in which individuals are engaged in many outreach activities and high-speed transportations.

The male to female ratio is quite similar to other studies by Rabadi and Anuradha et al^(4,6). This may be explained by the fact that males have predominant outdoors activities and are more exposed to violent reactions compared to females and also due to the fact that there are more male vehicle drivers than females⁷. Contrastingly in countries like Japan women participate in more social activities than men where the ratio has been reduced to 2:1⁽¹³⁾.

In midface, the most common fracture site is zygomaticomaxillary complex (15.5%) followed by Lefort II (7.9%) which was comparable to the studies by Dilip et al and Al-Ahmed et al^(11,12). This might be due to the prominence of zygoma complex and Lefort II is 2nd most common due to projection of nasal bone where prior impact is made.

In this study, the most common fracture site is mandible (49.69%) which was consistent with other studies^(8,9) by Barde (39.8%) and Saravanan et al (36 to 59%). mandibular fractures are most common because it is only the moving bone of craniofacial complex¹⁰ and also it grows forwards and downwards as age progresses. Nowadays, with the increasing number of automobiles, the manufacturing of half guarded helmets which guards only the cranial vault and midface might also contribute to increase in incidence of mandibular fractures. Most common fracture site in mandible is Para symphysis (19.38%) which is comparable to studies by Saravanan et al (44.83%) and Natu et al (31.4%)^(9,10). The reason

being the length of mandibular canine weakening the bone architecture and presence of tooth buds in pediatric population. The other theory being uneven distribution of tensile forces in this irregular curved region in cross section leading to accumulation of tensile forces. This is in contrary to studies conducted by Ellis et al, Adi et al and Shah et al who reported body region as the most common site^(14,15,16). Ahmed et al and Motamedi reported condyle as the most common site^(12,17). The study by Chalya et al showed increased incidence at angle region (18). Krimmer et al supported this by stating that angle fracture incidence increases along with presence of impacted molars in the region⁽³⁾.

While accounting for combination fractures symphysis and condylar fractures are the most common duo (4%) which is similar to other studies⁽¹⁰⁾. This might be due to transmission of tensile forces from Para symphysis region to cranial vault through condylar neck resulting in fracture at the site. This was contradicted by Saravanan et al as angle and parasymphy seal region⁽⁹⁾ and Dongas and Hall as Para symphysis with angle as most common fracture site⁽¹⁹⁾.

There is no correlation between etiology and fracture site but there is some association with demographic data such as gender and age groups as men most commonly involve in outdoor activities and interpersonal violence whereas female stay indoors. These data might change in future with current generation of women empowerment and increased involvement of women in social activities. There is correlation between pediatric and old age groups owing to increased tooth to bone ratio which were the groups more prone for fracture but fortunately pediatric population were guarded from such incidents by parents and old age people lead a humble, calm life after 50 years of age.

Conclusion

This study attempts to define current, predictable patterns of fracture in this part of the country. The development of reliable data base of injury pattern will be a useful guide for human resource and logistics management of maxillofacial injuries in the trauma patient population. This study concludes that maxillofacial injuries are more common in 20–30-year age group with male predominance and most common fracture being mandibular fractures (49.69%) followed by midface of which ZMC (15.5%) is most common fracture site. In mandible Para symphysis (19.83%) and Para symphysis with condyle fractures (4%) contributes to most common fracture sites in single and multiple fractures respectively.

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