

Cranio-Maxillofacial Fractures Seen At a Gwalior Chambal Region Hospital: A One-Year Prospective Study

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AIM: To investigate the epidemiological characteristics of maxillofacial fractures and associated fractures in patients seen in the Oral Surgery Unit of Maxillofacial trauma attached Gajraja medical college and JAH GROUP Hospital, Gwalior, Madhya PRADESH. The maxillofacial skeleton is commonly fractured due to its prominent position. The pattern of A maxillofacial fracture varies from one country to another.

METHODOLOGY: A one years-month prospective study was conducted. Data collected included socio-demographic factors, type and, etiology of injury, and post-surgery complications

RESULTS: One hundred thirty-two (2721) cases ranging from 5-70 yrs of age were reported, with a male: female ratio of 7.7:1. The 21-30 yr age got additional fractures and was the largest, comprising 51.51% of cases (n=68). Road traffic accidents contributed to 56.06% (n=74) of fractures. In total, 66% of the sample (n=87) suffered isolated mandibular fractures. Symphyseal and maxillary fractures were the most common mandibular and midfacial fractures, respectively. Among associated fractures, the femur was most affected. A total of 39 (29.54%) of patients had postoperative complications, of which infection accounted for 48.71% (n= 19), and malocclusion accounted for 17.94% (n=7).

CONCLUSIONS: Anticipated changes in maxillofacial trauma trends necessitate regular epidemiologic studies of facial fractures to allow for development and implementation of timely novel preventive measures

KEYWORDS: Trauma; Facial injuries; maxillofacial fractures.

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I. Introduction

Maxillofacial fractures are more prevalent in large cities due to heavy traffic and high incidence of violence. The causes, types, and sites of these fractures seem to vary across geographical location. Different studies have shown a relationship between maxillofacial fractures, defined sex and age groups, level of mechanization and development.¹⁻⁴ As man evolved and developed more machinery to ease day to day living, the incidence and severity of trauma injuries to the face also increased. Maxillofacial injuries are rarely fatal but subject the affected individual to tremendous physical and psychological anguish. Although maxillofacial injuries rarely cause death, they may cause airway compromise and excessive bleeding leading to death. Additionally facial trauma is associated with the cranio-cerebral injury in 20% of the casualties, another potential cause of death. Worldwide differences in the distribution and occurrence of maxillofacial fractures are said to be a result of differing socio-economic, cultural and environmental influences.⁵ More than 90% of the world's deaths from injuries occur in low and middle-income countries.⁶ In the last couple of years, India has undergone steady economic and social transformation, seeing increased traffic and population plus competition for resources in urban as well as rural areas.⁷ These factors have most likely led to changes in the patterns and severity of maxillofacial fractures and their causes.

The study was conducted at Gajraja medical college and JAH GROUP Hospital, Gwalior, the biggest referral hospital in the country; due to lack of well-manned public health care facilities, this hospital also serves as a primary health care facility. Thus, the patients seen are reflective of the pattern of oral and maxillofacial fractures

Within the greater part of the capital city of GWALIOR. Our search did not find any recent studies on maxillofacial fractures in GWALIOR; hence, we aimed to collect information regarding the epidemiology of oral and maxillofacial fractures (excluding teeth). The study also aimed to determine the associated fractures in patients seen at the Oral Maxillofacial TRAUMA CENTER Unit Gajraja medical college and JAH GROUP Hospital, Gwalior. The face is susceptible to injury in a modern, mobile and mechanized society hence it is more vulnerable in a crowded urban community. An understanding of maxillofacial trauma helps us to assess the patterns of trauma in Different countries and to establish effective measures through which injuries can be prevented [1]. Fractures of the facial skeleton are common following assault, road traffic accidents, falls, and sporting injuries. The frequency of fractures of the mandible, zygomatic complex and maxilla has been reported in a ratio of 6:2:1.

Surveys of facial injuries have shown that the etiology varies from one country to another and also within the

Same country depending on the prevailing socioeconomic, cultural and environmental factors [2, 3].

In the more economically advanced countries maxillofacial injuries are more often caused by interpersonal violence

in the form of fights, assaults and gunshot injuries. Studies from most developing countries have shown that

road crashes are the predominant cause of maxillofacial trauma. The objective of this retrospective study was to analyze the maxillofacial injuries with special attention to the age, incidence, fractures pattern, seasonal and daily variations and compare the results with similar studies in India and rest of the world.

Our objective was to the maxillofacial fractures treated in Maxillofacial TRAUMA CENTER Unit Gajraja medical college and JAH GROUP Hospital, Gwalior over a period of one year 'prospectively from April 2019 to March 2020.

The data was obtained by assessing patients as they presented in the clinic and on the unit ward. Patterns of maxillofacial fractures, concomitant fractures, loss of consciousness, helmets/seat belt use in case of road traffic accidents and assessment of the extent of postoperative complications were recorded at the time of each visit.

II. Methodology

A descriptive prospective study was conducted to investigate the epidemiological characteristics of maxillofacial and associated fractures in patients treated and or admitted at the age hospital. Patients treated at the unit over a period of one month, i.e., April 2019 to March 2020 were assessed. Data collection was limited to this one-month period due to the time demands placed on the researchers; at least one researcher had to be present each day of the week to ensure that patients were selected and entered into the study.

Information relevant to the study was obtained from the patient directly; when this was not possible, collateral history was obtained from either the police (who usually bring accident and mob justice cases to the hospital) or relatives attending to the patients. A questionnaire was designed to enable collection of relevant data based on the above objectives. The causes of injury were classified as road traffic accidents (RTAs), falls, assault, occupational, and sports gunshot injury

The road traffic accidents were further subdivided according to the role of the patient (i.e., driver, rider, passenger or pedestrian) and the type of vehicle (car, motorbike or bicycle). Vehicle and motorbike patients were asked if they had seatbelts or helmets, respectively.

The anatomic locations of mandibular fractures were classified according to Ivy and Curtis,⁸ while zygomatic complex fractures were classified as fractures of the arch, body of the zygomatic bone and comminuted fractures. Maxillary fractures were classified as Lefort I, II, and III.⁹ Maxillofacial fractures were evaluated and the diagnosis was agreed upon by all authors using both clinical and radiographic presentation to assess fracture position. Associated fractures were recorded as assessed and confirmed by their different specialties.

The associations between age, sex, type and cause of fractures were assessed for statistical significance using Chi-square tests. The level of significance (P) was set at 5%.

III. Results

A total of 2132 patients with 411 oral-maxillofacial fractures were treated at the unit, giving an average of 1.65 maxillofacial fractures per patient. Only 5% of patients treated at the unit had received primary care before being referred to the unit. The duration of the hospital stay ranged from one day for simple fractures, which were managed and patients discharged, to as long as three months for those with serious associated neurological complications.

The patients' ages ranged from 5-70 years, with a mean age of 28.32 (SD= 10.76). Of the sample, 117 (88.7%) were males giving a male to female ratio of 7.7:1.

Overall, the 21-30 year age group was the most affected, comprising 68 (or 53%) of patients. This age group was the most affected among both females and males, as shown in Table 1 (P value<0.05).

Road traffic accidents (RTAs) caused 56.06% of the injuries, followed by assault at 34.84%. Other causes included sports (3.79%), occupational incidents (3.03%) and gunshots (2.27%). Although the 21-30 age groups were most affected, there were no statistically

significant relationships between age group and cause of trauma (Tables 2, 3, 4). In total, 90 (68.94%) of patients had isolated mandibular fractures and 27 (20.45%) suffered isolated mid-facial injuries. The distribution of fractures according to cause of injury (Table 5) was found to be statistically significant (Chi-square= 28.27, P-value=0.005).

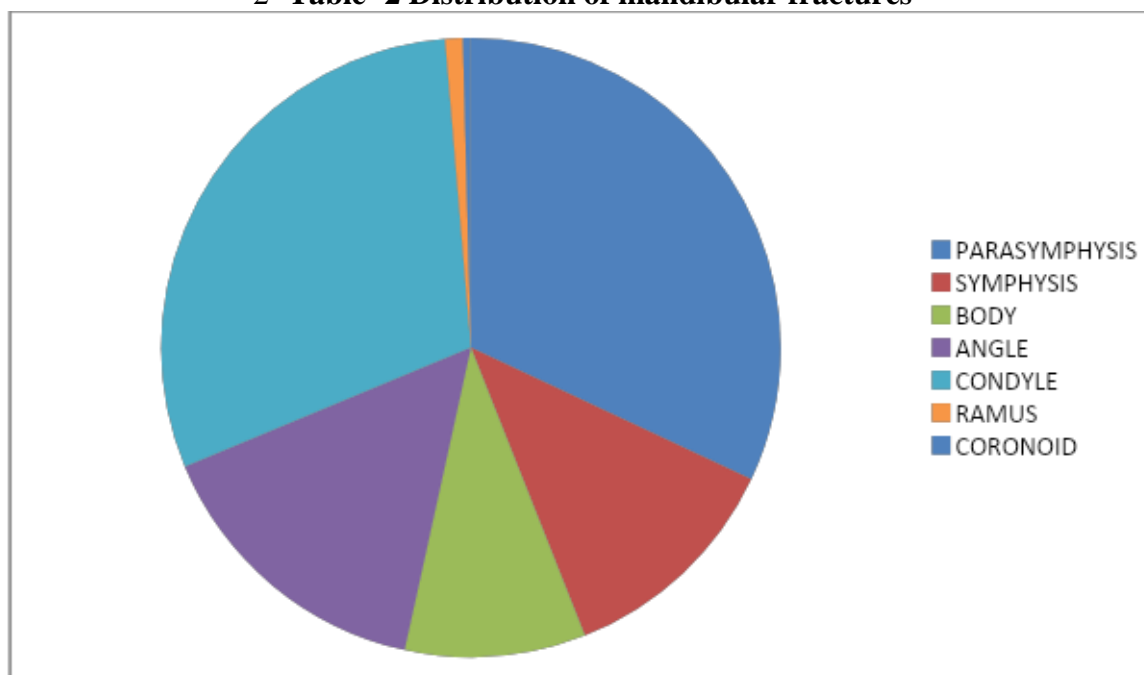
1- Table- 1 Frequency of maxillofacial fractures

Column	Males	Females	Total
Soft tissue injuries	102	20	122
Dentoalveolar	160	33	193
Mandibular fractures	939	96	1035
Middle-third of the face #	450	100	550
Panfacial #	200	32	232

Fractures

(Chi-square= 28.27, P-value=0.005).

2- Table- 2 Distribution of mandibular fractures



PARASYMPHYSIS	312
SYMPHYSIS	117
BODY	92
ANGLE	149
CONDYLE	292
RAMUS	9
CORONOID	4

(Chi-square= 28.27, P-value=0.005).

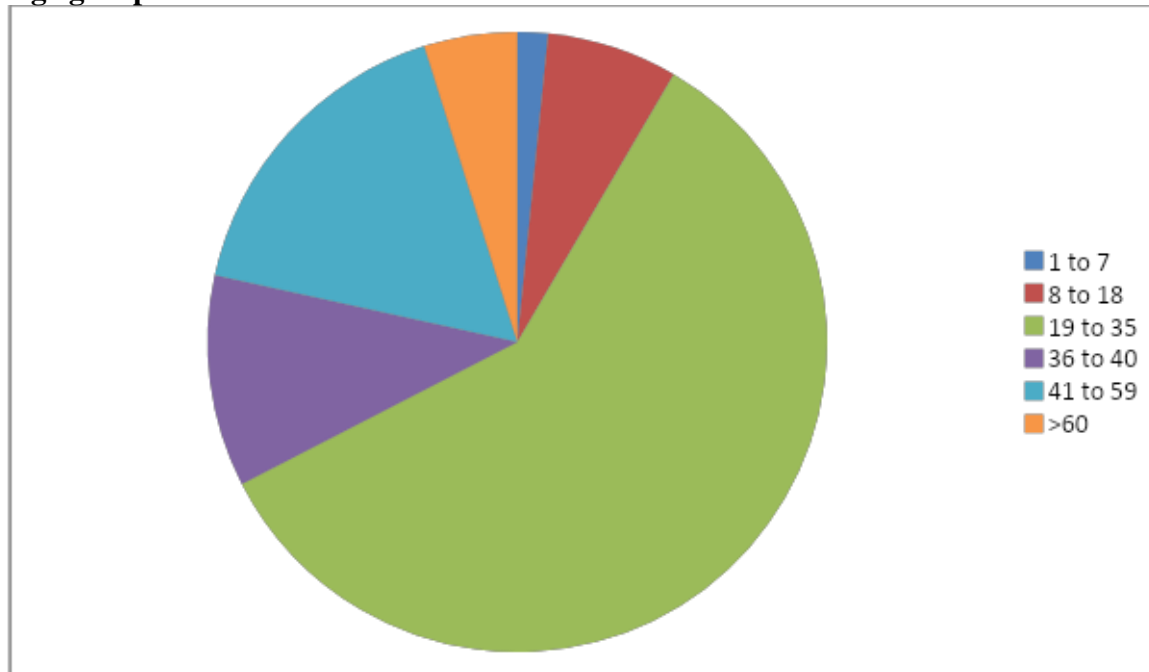
3-Distribution of mid-face fractures

	Male	Female	Total
Le Fort I	90	32	122
Le Fort II	158	34	197
Le Fort III	974	97	1071
Zygomaticomaxillary complex #	542	90	632
Nasoorbitoethmoid #	55	55	110
	1819	308	2132

Fractures

(Chi-square= 28.27, P-value=0.005).

4-Age groups and fracture distribution



age(years)	male	female
1 to 7	38	30
8 to 18	163	44
19 to 35	1408	127
36 to 40	263	37
41 to 59	398	78
>60	116	98

(Chi-square= 28.27, P-value=0.005).

5- Biology of maxillofacial fractures

Mode	Male	Female
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MVA	1518	210
Fall	250	120
Assault	300	52
Sports related	15	30
Occupational	10	4
Gunshot injury	6	2

(Chi-square= 28.27, P-value=0.005.

IV. Discussion

The incidences of maxillofacial fractures vary with the geographic region, socioeconomic status, culture and religion [3]. Maxillofacial injuries are more predominant in men than in women. In the present study, the male to female ratio was 6:1, which is comparable to most studies except for in Pakistan where the ratio was 32:1 [4]

The most commonly affected age group was 19–35 years, which is similar to the results of other studies

[1–3, 5–11]. The least affected age group was between 1 and 7 years as their facial skeleton is more elastic and less except for one study where sub condylar fractures were more common [10]. Studies with road traffic accidents as the main etiology for maxillofacial fractures have reported parasymphysis and condyle to be the common site of fracture. The mandibular body and angle fractures are common after assault [9]. The bilateral condylar fracture was the most common fracture in bilateral fracture category. The maximum combinations of fractures were symphysis with condyle followed by parasymphysis and angle. Midface fractures were comparatively lower than

mandibular fractures. This low incidence is related to the protection provided by the mandible and the cranium, which absorb most of the traumatic impact, as well as the fact that the mid facial bones are extremely elastic. The maxilla has been reported to be the most common site for midfacial fractures in elderly patients because of greater degree of pneumatization of the paranasal sinuses. However, some studies have reported the zygoma as the most common site of midfacial fractures due to its prominent location in the face [12]. Among fractures of the mid-facial region, zygomatic complex fractures were the most common, followed by Le Fort II fractures. This finding is similar to the other studies in the subcontinent except for one study, where nasal bone fractures were more common followed by zygomatic complex fractures [10]. In this study there were 317 fractures involving both the maxilla and the mandible, constituting 12 % of the total fractures. Pan facial fractures constituted 4.7 % of cases in another study in India [9]. In a study conducted in India the highest incidence of maxillofacial fractures occurred during September and October, the monsoon season. Increased outdoor activity in holiday destinations and decreased visibility during the monsoons are significant contributing factors for increase in road traffic accidents [5].

Most patients with maxillofacial fractures were seen late in the day, which is consistent with other studies in India.

This high incidence, in excess of the expected average, suggests the effect of variations in traffic density and the influence of additional exposure risk factors, including alcohol and possibly other intoxicating agents [5, 9, 10, 13].

All maxillofacial trauma patients were treated either by open reduction or closed reduction. We have not elaborated on the treatment as it is beyond scope of this article.

V. Conclusion

Though traffic regulations are strict, people do not follow play with their own life and others too.

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