ORIGINAL ARTICLE

RETROSPECTIVE STUDY OF PREVALENCE OF MAXILLOFACIAL FRACTURES IN BHOPAL, MADHYA PRADESH POPULATION

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ABSTRACT:
Accidents represent the major epidemic of non communicable disease in present century. They are no longer considered accidental; they are part of the price we pay for technological progress. The incidence is rising in the small and remote towns of the developing country like India. Maxillofacial fractures are one of the outcomes, and people of small cities are equally prevalent. In this study, we are discussing various types of fractures of oro- facial complex and their etiologies.
Key words: Maxillofacial, Non communicable, fractures.

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INTRODUCTION

Maxillofacial region (MFR) involves soft and hard tissues forming the face extending from frontal bone superiorly to the mandible inferiorly. The face being the most exposed part of the body is particularly prone to trauma[1]. Trauma to the facial region causes injuries to skeletal components, dentition as well as soft tissues of the face. Injuries to the maxillofacial region are increasing in frequency and severity[2]. With the technological advancements in the developing countries like India, the occurrence of road traffic accidents have been increased drastically over the period of last 10 years. Every 30 seconds someone dies on the world's roads. Annually over 1 million people die and over 25 million are injured or permanently disabled from road traffic injuries. Susceptibility increases by the effect of alcohol and other addictive drugs[3]. The overall effect is the increased numbers of maxillofacial fracture cases coming to local hospitals. With the change of life styles, improper distribution of available resources and lack of adequate income, the aggression level of people has been increased resulting in more number of physical assault cases. The severity and pattern of the fracture will depend on the magnitude of the causative force, impact duration, the acceleration impaired by it to the part of the body struck and the rate of acceleration change. The surface area on which the impact strikes is also relevant[4].

Various factors like the poor condition of roads, neglected traffic rules, increasing number of two and four wheelers, illiteracy, alcohol consumption etc., might be considered as the probable factors for those accidents[5].

The aim of the present study is to analyze retrospectively the age and sex distribution, etiology and location of fractures in a sample of patients visited between January 2010 to December 2015.

AIMS AND OBJECTIVES

The following parameters were taken into account:-

1. Age and sex distribution of maxillofacial trauma.
2. Etiological factors causing maxillofacial trauma.
3. Incidence of maxillofacial trauma due to road traffic accidents.
4. Pattern and demographic distribution of fractures at different sites of the maxillofacial skeleton.

MATERIAL AND METHODS: The study was a retrospective study conducted among Bhopal population from Jan 2010 to December 2015. Patients were selected in age range of 18-67 years. A predefined pro forma was used to collect the data regarding the age, sex distribution, etiology, associated factors and type of fractures. The diagnosis of a fracture is based on the clinical history, signs and symptoms, visual finding, manual examination and correct interpretation of radiographs. The pattern of facial fractures is determined according to the fractures of mandible, and mid face in relation to the different etiological factors.

For this study, the mandible was divided into condylar, coronoid, angle, body, symphyseal, parasymphyseal and dentoalveolar regions. In the middle-third of the face, fractures were recorded as Le Fort, I, II, and III types, zygomatic bones, nasal bones, naso –orbito- ethmoidal complex, orbital blow-out, and dentoalveolar fractures

Etiological factors were classified as road traffic accidents, fall from height and assault and sports injuries, gun shots, industrial, miscellaneous. The data was then computerized and subjected to statistical analysis.

RESULTS

Between January 2010 to December 2015, a total of 2193 maxillofacial fractures and associated injuries were collected in 1297 patients and analyzed.

Table I: Annual Incidence of Fractures

YEAR	NO. OF PATIENTS	FRACTURES
2010	210	350
2011	190	412
2012	187	316
2013	215	370
2014	240	315
2015	255	430
TOTAL	**1297**	**2193**

Table I shows incidence of fractures in 2010 to 2015. Maximum fractures were recorded in 2015.

TABLE II: Age wise distribution Maxillofacial Fractures

Age	Total	Male	Female
18-27	420	298	122
28-37	609	439	170
38-47	594	382	212
48-57	312	198	114
58-67	258	229	29
TOTAL	**2193**	**1546**	**647**

Table II shows age wise distribution maxillofacial fractures. Maximum fractures were seen in age group 28- 37 years.

TABLE III: Distribution of fractures depending upon etiology

Age	RTA	Fall from height	Physical assault	Sports	Gun shot	Industrial	Pathological	Misc.
18-27	240	130	10	40	1	2	0	2
28-37	432	90	50	10	12	5	1	12
38-47	307	115	70	22	40	30	5	5
48-57	108	88	60	17	33	4	2	0
58-67	169	57	15	0	6	7	3	1
TOTAL	**1256**	**480**	**205**	**89**	**155**	**48**	**11**	**20**

Table III shows distribution of fractures depending upon etiology. RTA was found to be the most common etiology of maxillofacial fractures.

Table IV: Site Distribution in Mandible

SITE	2010	2011	2012	2013	2014	2015	Total
Symphysis	29	30	31	24	23	31	168
Parasymphysis	37	32	25	28	28	38	188
Body	31	29	24	29	36	25	174
Condyle	32	27	22	29	24	33	167
Angle	35	33	19	25	26	31	169
Dentoalveolar	30	35	24	26	27	32	174
Coronoid	15	29	15	25	18	31	133
Total	208	215	160	186	182	221	Total

Table IV shows distribution of fractures in different parts of mandible. Parasymphyseal fracture was the most common lower third fractures.

Table IV: Site distribution in mid face region

SITE	2010	2011	2012	2013	2014	2015	Total
Lefort I	13	18	16	9	12	21	89
Lefort II	15	19	15	12	13	24	98
Lefort III	14	17	16	13	17	19	96
Zygoma(ZMC)	22	25	19	27	14	23	130
NOE	16	22	12	23	9	25	107
Nasal	20	19	11	24	5	26	105
Dentoalveolar	13	18	18	22	15	20	106
Zygomatic arch	11	21	20	21	16	18	107
Orbital blow out	10	18	13	15	15	14	85
Frontal	8	20	16	18	17	19	98
Total	142	197	156	184	133	209	Total

Table IV shows distribution of fractures in mid face region. Zygoma(ZMC) was mostly fractured.

DISCUSSION

This is the retrospective study conducted between 2010 to 2015. Patients between age group from 18-67 years having history of fractures were selected and analyzed for different types of fractures and etiology. Various studies across the world have shown that maxillofacial injuries depend upon the geographical condition road safety regulations, socioeconomic status, alcohol abuse etc[6]. The higher frequency of maxillofacial injuries among men compared to the women in the present study may be attributed to the fact that the females most often are confined to household works and they drive vehicle less frequently and more carefully than men. The fact that women are less exposed to fights, industrial heavy works and sports, makes them least susceptible. The findings were consistent with the findings of the study by Szontagh E et al (1993)[8] and Freidl S et al (1996)[9]. Road traffic accidents are still the major etiological factor in maxillofacial trauma cases. The high number of road traffic accident in this region can be attributed to underage driving, poor road condition, overspeeding, over-loading, lack of seat belt law obligation, substance abuse. This study showed that the maxillofacial fractures predominantly occurred in the age group of 38-47 years, followed by 18-27 years and 28-37. These findings being similar with the previous studies. The high incidence in 3rd decade of life might be due to

the facts that people belonging to this decade are more active, energetic, take active participation in dangerous exercises and sports activities and mostly involved in violence.

The lower incidence of maxillofacial fractures has been reported in 59-67 years in this study, probably as this age group is less active and less involved in outdoor activities. Similar incidence was found by Kadkhodaie MH in Iran[10] and Mahmeed BEA in Kuwait[11].

Trauma is now considered as a problem of young people, which may be because of their aggressive nature and careless driving on roads. The increasing RTA in developing country like India, even in its remote part may be attributed to many factors like sharing of roadways by pedestrians and animals with fast moving and slow moving vehicles, large numbers of poorly maintained roads, increasing numbers of two and four wheelers, with spread disregard of traffic rules, overloaded buses, poor street lights etc. RTA is the major cause of the fractures followed by fall from height and physical assault. This is in agreement to studies carried out by Szontagh E et al[8] , Hogg NJ[12].

The prevalence of mandibular fractures is more as compare to mid -face factures. The prevalence is more in 2015 as compared to previous years. The higher involvement of mandible may be attributed to its prominence and also its exposed anatomical position on the face. Most victims of RTA will try to avoid their head against injury at the time of accidents and thus in the process of avoiding their head, may receive maximum impact on the mandible. The enforcement of certain laws like use of seat belts and wearing helmets may reduce such incidences. The studies by Szontagh E[8], Chandra Sekhar[13] showed mandibular fracture as the most common type of fracture which is consistent with our study. Amongst the all mandibular fracture cases in the present study, parasymphyseal fracture was highest in number followed by body, dentoalveolar, angle, symphysis, condyle and coronoid. These findings are comparable with studies carried out by K. Subhashraj N et al[4] and Buchanan[14].

In mid face fractures Zygoma had maximum fractures followed by zygomatic arch, NOE, dentoalveolar, nasal, lefort II, lefort III, lefort I and orbital out fractures. This is because of the prominent positions; zygoma, zygomatic bone and nasal bone are more vulnerable to trauma followed by lefort fractures.

CONCLUSION

This study concluded that road traffic accidents were the major cause of fractures. The second most common cause was a fall from height followed by assault. Most fractures occurred in the age range of 28-37years. The mandible was the most frequent site involved. Among maxillary fractures, zygoma fractures were most common. Care of injured patients should include not only management of the acute phase, but also combine preventive programs and interventional programs aimed at reducing the incidence of maxillofacial fractures. Therefore, there is a need to ensure strict compliance of traffic rules and regulations, implement improvement in automotive safety devices, organize prevention programs to minimize assaults, implement school education in alcohol abuse and handling potentially hostile situations, improve protection during sporting activities, and legislate wearing of protective headgear in workers. Preventive strategies remain the cheapest way to reduce direct and indirect costs of the sequelae of trauma. Societal attitudes and behaviors must be modified before a significant reduction in the incidence of maxillofacial fractures will be seen.

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