INCIDENCE AND PATTERN OF MAXILLOFACIAL TRAUMA IN A TEACHING HOSPITAL

Fareedi Mukram Ali[1], Yaswant Kumar DS[2], Varsha H Tambe[3], Kedar Saraf[4], Prasant MC[5], Mahesh Ahire[6], Dipak Sahane[7].

ABSTRACT

Background: Among various injuries seen in emergency department maxillofacial injuries are most common in occurrence. Injuries to maxillofacial area mandate special attention due to its close proximity with important vital structures in head and neck region. The treatment of maxillofacial injuries is a challenge in achieving full functional and esthetic results to oral and maxillofacial surgeons.Aim of the present study to determine the incidence and pattern of maxillofacial trauma and associated complications in a Teaching Hospital in Rural Maharashtra.

Method: A retrospective study done from Jan 2011 to Nov 2013 in SMBT Dental College and Hospital Sangamner Taluka, Ahmednagar District,Maharashtra,India. Data was analyzed with respect to incidence of the trauma, age and sex, types of injury, treatment and complications if any, were recorded from the patient records.

Result: This retrospective study was conducted in SMBT Dental College and Hospital Sangamner from January 2011 and November 2013, (23 months Period). Patients records were examined for all details. A total of 115 patients had reported during this period and of them 75 (65.21%) were males.The frequently involved age group was 21-40 years in 82cases (71.3%).Most common area involved was mandible with 69 cases (60%). Maxillary area was involved in 46 cases (40%), Most common anatomical location in mandible was the angle area 20.29% and 74.78% fractures were simple fractures and closed reduction was employed in 60.87% of cases.

Conclusion: The present study indicated that majority of patients with maxillofacial trauma were young adult Males and most common etiologic factors was Road Traffic Accidents.It can therefore be concluded that although if not all most of the RTA are preventable and immediate awareness campaign for Road safety should be started and adverse effects of drunken driving should be highlighted. Also implementation of law and road repairs should be undertaken to improve the situation.

Keywords: Maxillofacial Trauma, Road Traffic Accidents,Treatment

How to cite this Article: Ali FM,Kumar DSY,Tambe VH,Saraf K,Prasant MC,Ahire M,Sahane D.Incidence and Pattern of Maxillofacial Trauma in a Teaching Hospital.Arch CranOroFac Sc 2015;3(1):13-17.

Source of Support: Nil.

Conflict of Interest: Nil.

www.acofs.com
Use the QR Code scanner to access this article online in our databse
Article Code: ACOFS0034

INTRODUCTION

Maxillofacial region involves soft and hard tissues forming the face extending from frontal bone superiorly to the mandible inferiorly. Facial trauma is one of the most prevalent traumas since it is the most exposed part of body and it is the one that is least protected [1].Facial injury is often accompanied by emotional distress. In addition to the restoration of physical appearance and functional status there is also an urgent need for psychosocial care[2]. Trauma to the facial region causes injuries to skeletal components, dentition as well as soft tissues of the face. On the maxillofacial region, mandible and nose fractures are the most prevalent, followed by the zygomatic bone [3, 4].Maxillofacial fractures may occur alone or in combination with other bones fractures. Fracture pattern depends on the mechanism of injury,Magnitude and direction of impact of force and anatomy of site [5]. Maxillofacial injuries can occur as an isolated injury or may be associated with multiple injuries to the head, chest, abdominal, spinal and extremities [6]. The primary cause of maxillofacial fractures throughout the world is road traffic accidents and it is reported to be the leading cause of maxillofacial fractures in developing countries [7 -10]. The management of injuries to the maxillofacial complex remains a challenge for oral and maxillofacial surgeons, demanding both skill and a high level of expertise. Open reduction and internal fixation of maxillofacial fractures has been reported to results in a patient with a satisfactory facial appearance and restoration of optimal function[10, 11]. Incidence of Maxillofacial injuries varies widely throughout the world. A study done by K. Subhashraj et al; (2007) 42% had soft tissue injuries, 37% had mid face fractures, and 16% had mandibular fractures. Road crashes particularly involving motorcycles, accounted for (62%) of cases[12]. The Aim of the study was to determine the common pattern of injuries and to determine the etiological spectrum, injury characteristics and treatment outcome of these injuries in our setting.

MATERIALS AND METHODS

A retrospective study of maxillofacial injuries at SMBT Dental College and Hospital Sangamner Taluka, Ahmednagar District,Maharastra India, between January 2011 and November

2013 and data extracted from patients who were either treated in Maxillofacial Surgery unit or in outpatient department. This data was analyzed for age, gender, etiology, types and sites of fracture, treatment provided and complications if any, were reviewed and analyzed. All intentional injuries (suicidal Attempts) were excluded from the study purview. The study was approved by the Hospital Ethics Committee SMBT Dental College and Hospital.

RESULTS

This retrospective study was conducted in SMBT Dental College and Hospital Sangamner from January 2011 and November 2013,(23 months Period).Patients records were examined for all details and data was collected and analyzed. All cases of self inflicted injuries and attempted suicides were not included in this study. Table 1 shows that Total number of cases were (n = 115), which gives an incidence of approximately 5 cases per month. Total Number of males was (n = 75) and females was (n =40) the male to female ratio was (1.87: 1), Maximum number of cases reported were between age group 21 to 40 years:82 cases(71.3%).

Table 1: Age and Sex wise distribution of Maxillofacial Trauma cases

Age Group years	Males	Females	Total
1 - 10	1	0	1
11 – 20	3	1	4
21- 30	19	21	40
31 – 40	28	13	42
41- 50	17	4	21
51 – 60	7	1	8
Total	75 (65.22%)	40 (34.78%)	115 (100%)

Table 2 shows the distribution of Maxillofacial fractures of the total 115 cases 46 cases (40%) were of the Maxillary Fractures and 69 cases (60)% were of Mandibular region, this shows that mandibular area is more vulnerable to fractures in this region. Vast majority of cases were of Road Traffic Accidents (RTA).

	Males	Females	Total	%
Total Number of cases of Maxillary Fractures	17	29	46	40%
Total Number of cases of Mandibular Fractures	45	24	69	60%
Total	62	53	115	

Table 2: Distribution of Maxillary and Mandibular Fractures

The Table 3 indicates the types and distribution of fractures, most of the fractures were simple fractures occurring in 34 cases (29.56%) in Maxillary region and 52 cases (45.21%) occurred in Mandibular region bringing to a total of 86 cases (74.78%) of simple fracture cases. Number of cases of compound fractures was 25 (21.74%) out of which in Maxillary area 10 compound fractures (8.7%) were reported and Mandibular area had 15 (13.04%) compound fracture cases. Complex fracture was reported only in 4 cases (3.5%) both maxillary and mandibular

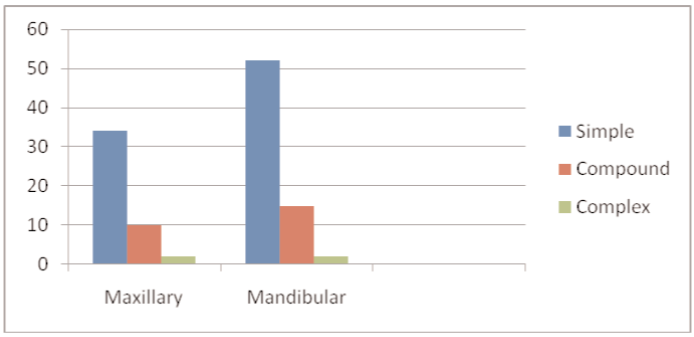

Table 3: Type and distribution of Fractures

area had 2 cases each.Out of total 115 recorded maxillofacial injuries Maxillary fractures occurred in 46 cases (40)% of individuals.Table 4 shows Anatomical Distribution of Maxillofacial Trauma cases. A total of 29 (63.04%) cases were males and 17 (36.95%) occurred in females. Male to Female ratio was (1.7:1). Most frequently recorded fracture was Le fort I (34.78%) followed by Le fort II (26.08%) , Le fort III (21.74%) and Zygomaticomaxillary complex fractures (17.39%).

Anatomical Location	Sex		Total Percentage
Maxillary Fractures	Males	Females	
Le fort I	9	7	16 (34.78%)
Le fort II	8	4	12 (26.08%)
Le fort III	7	3	10 (21.74)
Zygomaticomaxillary complex Fractures	5	3	8 (17.39%)
Total	29	17	46 (100%)
Mandibular Fractures			
Condyle	7	4	11 (15.94%)
Coronoid	6	3	9 (13.04%)
Ramus	4	1	5 (7.24%)
Angle	9	5	14 (20.29%)
Body	6	3	9 (13.04%)
Parasymphysis	8	4	12 (17.39%)
Symphysis	5	4	9 (13.04%)
Total	45	24	69 (100%)

Table 4: Anatomical Distribution of Maxillofacial Trauma Cases

Mandibular Fractures occurred in 69 (60%) of cases, most common areas involved in the mandibular region was Angle fractures which was reported in 14 cases (20.29%) followed by parasymphysis area 12 cases (17.39%) and condylar fractures in 11 cases (15.94%). Coronoid, Body and Symphysis fractures were recorded in 9 (13.04%) cases each.

Table 5 shows the etiology of the Maxillofacial Trauma. Majority of cases 54.78% were due to Road Traffic Accidents RTA, Second common factor was due to falls and accidental injuries which was reported in 15.65% individuals and followed by interpersonal violence 13.04%. Sport related injuries were reported in 7.82% of the individuals and 2.6% of reported cases were due to animal hits which occur mostly in our rural type of setting. Most of these patients (101 cases 87.83%) reported to our Hospital within 24 hours of the accident and (14 cases 12.17%) reported within 48 to 72 hours of accidents.

Cause of injury	Frequency	%
RTA	63	54.78
Falls/ injuries	18	15.65
Interpersonal Violence	15	13.04
Sports Related Injuries	9	7.82
Animal hit	3	2.6
Miscellaneous	7	6.08
Total	115	100

Table 5: Etiology of Maxillofacial Trauma

Table 6 shows the methods of management of the maxillofacial trauma cases.Closed reduction was performed in 70 cases (60.87%) with intermaxillary fixation using Arch bars. Open reduction using Titanium Plates was done in 16 cases (13.91%) and 8 (6.95%) of cases were managed conservatively. Fractures in pediatric patients which were undisplaced were managed by conservative means. Fractures in edentulous mandibular region were managed by circum-mabdibular wiring using gunning splints.

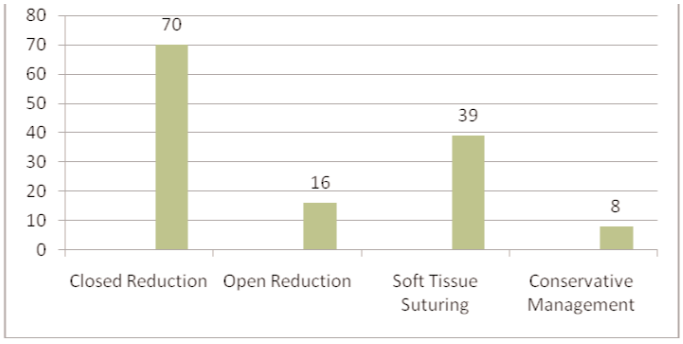

Table 6: Method of Management of Maxillofacial Trauma employed

Table 7 shows complications that occurred.In 11 cases (9.56%) complications were recorded out of which loss of aesthetics was reported in 2 of the individuals ,2 cases reported with surgical site infection.Other complication which were recorded were scars (3) cases, occlusal irregularities, anaesthesia and Paraesthesia in (1) case each in fracture of the mandible where there was a damage or severing of the Inferior Alveolar Nerve fibers.

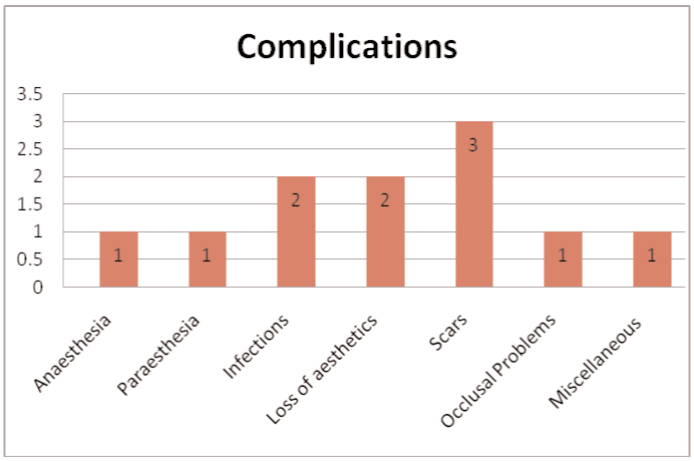

Table 7: Complications of Maxillofacial Trauma

DISCUSSION

The pattern of maxillofacial injuries varies widely from one geographical location to another depending on the etiological factors, socioeconomic status and cultural characteristics [8, 12,13]. This study showed that the maxillofacial fractures predominantly occurred in the age group of 21- 40 years. These findings being similar with the previous studies [14-16] High prevalence of injuries may be due to the fact that these age group people are active and are more involved in daily activities as compared to the other age groups.

The male to female ratio in our study was 1.87:1.Male dominance in our study is in agreement with various other studies which have reported the same [10, 17, 18].In this present study 54.78% maxillofacial injuries were caused by RTA which is consistence with other similar studies in developing countries [8, 10, 19, 20]. It may be due to the fact that male are in general at a greater risk due to their participation in out door activities consequently exposing them to various risk factors such as driving, sports and some times involve in high risk behavior. There is also a trend of higher frequency of RTA in developing countries which may be due to non compliance with road safety norms, unsuitable road conditions, other traffic violations and usage of vehicles without safety features, and use of alcohol, other drugs and intoxicating agents [21]. Fall from height was the second most common cause of maxillofacial trauma in our study which is around 15.65%,it is common for the people in our country to sleep on roof tops and large population of such individuals includes children who have fallen from height while playing or flying kites. It is in agreement with a finding by Al-Kateeb T et al.who reported 20% of maxillofacial injuries due to fall [14].

Sports related injuries were 7.82% in our study.Most of the injuries were in subjects below the age of 20 years highlighting the role of sports in younger age group a similar finding was presented by Cassas KJ (2006) [22]. Interpersonal violence was the cause of 13.04% of maxillofacial trauma this may be attributed to the fact that this hospital is situated in a rural area and is largely attended by relatively poor surrounding population. Other factors

which may have a role in facial injury due to assaults are alcohol and unemployment. Youth of lower socioeconomic group consume alcohol due to frustration of unemployment and end up in arguments brawls leading to violence[23,24] Other causes of interpersonal injuries includes the domestic violence mostly the females are the victims of such episodes it is also quite common in rural areas. Animal hits were cause of 2.6% of injures this could be to our Rural background where there is a greater use of animals for various activities including agriculture.

In this study the Mandibular fractures (60%) were more common than maxillary fractures this may be due to the fact that the mandible is the most prominent bone in the face and is often fractured more in comparison to the strongly supported middle third of the face [25]. The site and relative frequency of fractures of the mandible depend on the number of fractures sustained and the dentition of the jaws.In this study in mandibular fractures the common involved area was Angle fracture (20.29%) a similar finding was reported by Akama et al. and Roodeet al.[26, 27].They also reported the angle to be most common site of mandibular fractures. The second frequently occurring fracture in our study was the parasymphysis (17.39%) followed by condyle fractures (15.94%) which is in agreement to Rishi B et al. who reported that parasymphysis was the common site of fractures in mandible followed by condyle [28]. Most frequently recorded Middle third face fracture was Le fort I (34.78%) followed by Le fort II (26.08%) ,Le fort III (21.74%) and Zygomaticomaxillary complex fractures (17.39%). It is in contrast to studies which indicate that Zygmoaticomaxillary complex was the most commonly involved in the fractures [28].

Most commonly employed method of management of these fractures was closed reduction (60.87%) using arch bar and intermaxillary fixation and splints. In developing countries like our people prefer closed reduction than open reduction [10] the other factors could be cost, feasibility and skill of the surgeons. Complications were observed in 9.56% of cases slightly higher than other studies which reported around 5% complications [29, 30].Most common complication was loss of aesthetics followed by surgical site infection.The other complications reported were scars,occlusal irregularities, anaesthesia and paraesthesia.This may be due to several reasons, most common of which is due to low socioeconomic status many individuals do not take medications properly and most often they fail to report on suggested post operative appointments which may have slightly increased complication rates in our settings.

CONCLUSION

The present study indicated that majority of patients with maxillofacial trauma were young adult males.The most common etiologic factors were Road Traffic Accidents followed by fall from height and interpersonal violence. The most common area involved was mandible and frequently involved anatomic site was the Angle of mandible followed by parasymphysis. Thus, it can be concluded that although if not all most of the RTA are preventable and immediate awareness campaign for Road safety should be started and adverse effects of drunken driving should be highlighted. Also implementation of law and road repairs should be undertaken to improve the situation.

REFERENCES

1. Alvi A, Dohert T, Lewen G. Facial fractures and concomitant injuries in trauma patients. Laryngoscope 2003; 113:102-6.
2. Wong EC, Marshall GN, Shetty V, Zhou A, Belzberg H, and Yamashita DD. Survivors of violence-related facial injury: psychiatric needs and barriers to mental health care. General hospital psychiatry 2007; 29(2):117-122.
3. Hogg NJ, Stewart TC, Armstrong JE, Girotti MJ. Epidemiology of maxillofacial injuries at trauma hospital in Ontario, Canada, between 1992 and 1997. J Trauma 2000; 49:425-32.
4. Brasileiro BF, Passeri LA. Epidemiological analysis of maxillofacial fractures in Brazil: a 5-year prospective study. Oral Sur Oral Med Oral Pathol Oral RadiolEndod 2006; 102:28-34.
5. Nayyer MS, Ekanayake MB, 'Assessment of maxillofacial injuries' Pak Oral Dent J 2001; 21:12-18.
6. Akama MK, Chindia ML, Macigo FG, Ghuthua SW: Pattern of maxillofacialand associated injuries in Road traffic accidents. East Afr Med J 2007; 84:287-90.
7. Oji C. Jaw fractures in Enugu, Nigeria, 1985-95. Br J Oral Maxillofac Surg 1999; 37(2):106-9.
8. Chandra Shekar BR, Reddy C: A five-year retrospective statistical analysis of maxillofacial injuries in patients admitted and treated at two hospitals of Mysore city. Indian J Dent Res 2008; 19:304-8.
9. Umar KB, Shuja RA, Ahmad K, Mohammad TK, Abdus S: Occurrence and Characteristics of Maxillofacial Injuries - A Study. Pakistan Oral & Dental Journal 2010, 30:57-61.
10. Al Ahmed HE, Jaber MA, Abu Fana SH, Karas M: The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 2004; 98:166-170.
11. Wimon S, Kasemsak P: The Epidemiology of Mandibular Fractures Treated at Chiang Mai University Hospital: A Review of 198 Cases. J Med Assoc Thai 2008; 91:868-74.
12. K. SubhashrajN. Nandakumar, C. Ravindran, Review of maxillofacial injuries in Chennai, India: A study of 2748 cases British J of Oral and Maxillofacial Surgery 2007; 45(8):637-39.
13. Shah A, Shah AA, Salam A: Maxillofacial fractures: analysis of demographic distribution in 320 patients. Pak Oral Dent J 2006; 26:235-37.

14. Al-Khateeb T, Abdullah FM.Craniomaxillofacial injuries in the United Arab Emirates : a retrospective study. J Oral Maxillofac Surg 2007; 65(6):1094-101.

15. Olasoji HO, Tahir A, Arotiba GT. Changing pictures of facial fractures in northern Nigeria. Br J Oral Maxillofac Surg 2002; 40(2): 140-3.

16. Adebayo ET, Ajike OS, Adekeye EO. Analysis of the pattern of maxillofacial fractures in Kaduna, Nigeria. Br J Oral Maxillofac Surg 2003; 41(6):396-400.

17. Umar KB, Shuja RA, Ahmad K, Mohammad TK, Abdus S: Occurrence and Characteristics of Maxillofacial Injuries - A Study. Pakistan Oral & Dental Journal 2010; 30:57-61.

18. Wimon S, Kasemsak P: The Epidemiology of Mandibular Fractures Treated at Chiang Mai University Hospital: A Review of 198 Cases. J Med Assoc Thai 2008; 91:868-74.

19. Erol B, Tanrikulu R, Gorgun B: Maxillofacial fractures: analysis of demographic distribution and treatment in 2901 patients (25-years experience) J CraniomaxillofacSurg.2004; 32:308-13.

20. Hussain S, Ahmad M, Khan I, Anwar M, Amin M, Ajmal S: Maxillofacial trauma: current practice in management at Pakistan Institute of Medical Sciences. J Ayub Med Coll Abbottabad 2003; 15:8-11.

21. Ansari MH. Maxillofacial fractures in Hamedan province, Iran: a retrospective study (1987-2001). J Craniomaxillofac Surg 2004; 32(1): 28-34.

22. CassasKJ ,Cassettari-Wayhs A. Childhood and adolescent sports-related overuse injuries. Am Fam Physician 2006 Mar 15; 73(6):1014-22.

23. Telfer MR, Jones GM, Shepherd JP. Trends in the aetiology of maxillofacial fractures in the United Kingdom (1977-1987) Br J Oral Maxillofac Surg 1991; 29:250-5. [PubMed]

24. Magennis P, Shepherd J, Hutchison I, Brown A. Trends of facial injuries: Increasing violence more than compensates for decreasing road trauma. Br Med J 1998; 316:325-6.

25. Adeyemo WL, Iwegbu IO, Bello SA, Okoturo E, Olaitan AA, Ladeinde AL, et al. Management of mandibular fractures in a developing country: a review of 314 cases from two urban centers in Nigeria. World J Surg 2008 Dec; 32(12): 2631-5.

26. Akama Mk, Chindia ML, Ndungu FL. Occurrence and pattern of mandibular fractures at Kisii District Hospital, Kenya. East Afr Med J 1993; 70:732-733. [PubMed]

27. Roode GJ, Van Wyk PJ, Botha SJ. Mandibular fractures: an epidemiological survey at the Oral and Dental Hospital, Pretoria. SADJ 2007; 62:270-274. [PubMed]

28. Rishi Bali, Parveen Sharma , AmandeepGarg , Guneet Dhillon A comprehensive study on maxillofacial trauma conducted in Yamunanagar, India J Inj Violence Res 2013; 5(2): 108-116.

29. Mohammad Hosein,KalantarMotamedi, An assessment of maxillofacial fractures: A 5-year study of 237 patientsJournal of Oral and Maxillofacial Surgery 2003; 61(1):61-64.

30. BehçetErol, RezzanTanrikulu, BelginGörgün Maxillofacial Fractures. Analysis of demographic distribution and treatment in 2901 patients (25-year experience) Journal of Cranio-Maxillofacial Surgery 2004; 32(5):308-313.

Authors

1. Dr.Fareedi Mukram Ali
Reader, Dept of Oral & Maxillofacial Surgery
SMBT Dental College, Sangamner,Taluka
Maharashtra State, India.

2. Dr.Yashwant Kumar DS
Reader, Dept of Oral & Maxillofacial Surgery
College of Dental Sciences, Davengere
Karnataka State, India.

3. Dr.Varsha H Tambe
Senior Lecturer,
Dept.of Conservative Dentistry & Endodontics
SMBT Dental College, Sangamner,Taluka
Maharashtra State, India.

4. Dr.Kedar Saraf
Reader, Dept of Oral Medicine & Radiology
SMBT Dental College, Sangamner Taluka, India

5. Dr.Prasant MC
Prof & Head,Dept of Oral & Maxillofacial Surgery
RKDF Dental College, Bhopal, India

6. Dr.Mahesh Ahire
Reader, Dept. of Periodontics
SMBT Dental College, Sangamner Taluka, India.

7. Dr.Dipak Sahane
Lecturer, SMBT Dental College.
Sangamner Taluka, India.