

EPIDEMIOLOGY OF MAXILLOFACIAL FRACTURES AT A TERTIARY CARE HOSPITAL

Muhammad Masood Khan, Shafqat Rehman, Muhammad Ishaq, Ghassan Umair, Tahirullah, Anam Aziz, Gulzar Bukhari

ABSTRACT

Introduction: The epidemiology of maxilla-facial fractures varies in different countries and different cultures. Factors effecting include population concentration, cultural background, lifestyle, and socioeconomic status.

Material and Methods: In this cross sectional observational study, 302 hospitalized patients were evaluated from the department of maxillofacial surgery at Lady Reading Hospital, Peshawar. The site and cause of fractures and treatment plans were recorded in a personal computer. Data analysis was performed, using SPSS version 20.

Results: The majority of patients were male (81.78%). Most subjects were within the age range of 20-30 years. Fractures were mostly caused by road traffic accidents, followed by firearm injuries and blast injuries. The most common site of involvement was the mandible (angle of mandible). Most common modality of treatment was closed reduction (66.88%, n=202) followed by open reduction and internal fixation (21.50%, n=65).

Conclusion: Road traffic accidents are the main cause of maxillo-facial injuries. Strict rules of road safety should be enforced on general population along with general awareness programs.

Key words: Facial injuries, Face fractures, Maxillofacial trauma, Trauma

INTRODUCTION

Maxillofacial region is the most important part of the body starting from the base of the skull to the hyoid bone. Maxillofacial trauma can be life threatening especially if it compromises the airway. Moreover, facial trauma can significantly damage important functions of sight, smell, mastication and deglutition. It can cause permanent disfigurement with severe psychological impact on the patients. Moreover, these traumas impose a significant financial burden on individuals and societies^{1,2}.

Causes of facial soft and hard tissue injuries include occupational injuries, falls, motor vehicle accidents (MVAs), sports injuries, and interpersonal violence³. Another important cause in our region is bomb blast injuries. The epidemiology of maxillofacial trauma varies in different parts of the world and it is influenced by Population concentration, lifestyle, cultural background, and socioeconomic status⁴⁻⁶. For example there is higher incidence of sports-related facial injuries in regions where there is higher participation of people in heavy contact sports such as rugby⁷. Similarly the incidence of violence-related trauma is also higher in the lower socioeconomic areas.⁵ The epidemiology of trauma is also changed with time due to changes in

Department of Dentistry & Maxillofacial Surgery, LRH, Peshawar, Pakistan

Address for correspondence:

Dr. Muhammad Masood Khan

Department of Dentistry & Maxillofacial Surgery, LRH, Peshawar, Pakistan
Cell: 0312-9379692

legislature. For example the incidence of motor vehicle accidents related deaths is decreased due to compulsory seat-belt related legislature.⁸ Epidemiological studies are a useful tool in planning resource allocation. Periodic examination of trauma data is important therefore in planning hospital workloads. It also helps government administrators to determine the funding allocations. Similarly it is also a guide for the health care providers to plan appropriate education and training of specific skills to deal with particular health problems and to refine treatment algorithms for patients with this type of injuries.

There are several studies in literature which have investigated the epidemiology of facial injuries in different countries of the world⁹⁻¹¹. However, there is still limited data regarding the epidemiology and treatment of facial injuries in developing countries, like Pakistan. The aim of this study is to identify the changing trend in the demographics, etiology, distribution, and treatment of maxillofacial injuries in our setup.

MATERIALS AND METHODS

In this observational study, 302 patients reported to the Oral and Maxillofacial Surgery Department Lady Reading hospital Peshawar from jan 1,2014 to dec 31,2014 were included. The exclusion criteria included those getting immediate treatment from outpatients department without hospitalization and patients with only soft tissue injuries without fractures. All demographic data (e.g., patient's age and gender), chief complaints, cause of trauma, involved injured bones, concomitant fractures and injuries of soft tissues and other organs, facial examinations, and radiographic images were

recorded on personal computer. Maxillofacial fractures were treated either by closed reduction (CR) or open reduction & internal fixation (ORIF) or they may be treated conservatively and followed-up for re-evaluation of the status of suspected fractures.

The collected Data was analysed using SPSS version 20. Descriptive statistics were used to describe the variables.

RESULTS

Demographics

Total 302 patients were included in study with mean age of 29 ± 1.76 yrs (range 10-70 yrs). Maximum number of patients were between the age of 20-35 yrs. There were 247 male and 55 female patients with male to female ratio of 4.49:1.

Etiology

Road traffic accidents were the most common cause of maxillofacial fracture accounting for 71.52% cases (n=216) followed by Firearm injuries 13.24% cases (n=40). Blast injuries also contributed significant cases 10.59% (n=32). Other causes included interpersonal violence 3.31% cases (n=10), Falls from height 0.49% cases (n=3) and sports related injuries 0.33% cases (n=1)

Site of Fractures

Figure 1 illustrated distribution of fracture at each site in terms of the total number of fractures and proportion of patients with the fractures. The mandible is the most frequently fractured bone (45.03% n=136). Zygoma was the most common mid-face bone affected (33.6% n=100), followed by the Le-Fort fractures (11.92% n=36). Dentoalveolar fractures were noted in 7.28% of patients (n=22), nasal bone fractures 1.98% (n=06) and frontal bone fractures 0.66% (n=02). In the mandible, the angle was the most commonly involved site (39.70% n=54) then parasymphysis 21.32% (n=29), body 16.17% (n=22), condylar fractures 13.97% (n=19), ramus 3.67% (n=05), symphysis 2.94% (n=04) and coronoid 2.20% (n=03).

Management

Most common modality of treatment was closed

Table 1: Site of Fractures

Fracture Type	Numbers	Percentage
Dentoalveolar Fracture	22	7.28
Mandibular Fracture	136	45.03
Zygoma Fracture	100	33.11
Lefort Fracture	36	11.92
Nasal Bone Fracture	06	1.98
Frontal bone Fracture	02	0.66

reduction (66.88%, n=202) followed by open reduction and internal fixation (21.50%, n=65). Thirty five patients (11.58%) were managed conservatively without any surgery. However, treatment modality was different for extremes of ages. For example in the age group of < 15 years, most cases were managed by closed reduction (70.2%); closed reduction was also reported in the age group of > 50 years (78%). However, in the age group of 16-49 years, open reduction and internal fixation (ORIF) was the predominant treatment method (52.3%).

DISCUSSION

With the advances in technology and urbanization of the country side incidence of maxillofacial injuries is increasing day by day. In our study maximum number of maxillofacial fractures occurred between the age of 20-30 yrs. This is in accordance with many other studies¹²⁻¹⁶. This is because of the reason that people are physically active, enthusiastic and take risks easily at his age. Similarly in our study maxillofacial fractures are more common in males like other studies¹⁷⁻²². Males are generally more socially active and involve in life threatening activities, violence and sports. Road traffic accident is the most common reason of maxillofacial fractures in our study. Similar results have been shown in many other studies²³⁻²⁵. Disrespect for traffic laws, together with the high speeds, and a frequent disregard for the need to wear a helmet are two problems in this region, either due to hot weather or discomfort, which leads to serious accidents. However there are other studies showing physical violence and assault as most common etiological factor²⁶, still other studies show firearm injuries as most common¹³. In our study firearm injuries and blast injuries are the second and third most common reason of maxillofacial fractures. The main reason for this is that our hospital is the main tertiary care centre for all the victims of war on terror which has contributed significantly in these injuries.

Our findings showed that the mandible was the most involved bone (45.03%) followed by zygomatic complex fractures (33.6%), results that are in agreement with those reported by other authors²⁶.

The most prevalent method of treatment in our study was based on closed reduction (66.88%), which was relative to other results^{27,28}. No complications concerning occlusion and mouth opening were encountered in these patients after a follow up of 06 months. However, in age group 16-49 yrs ORIF with mini-plates was the preferred modality of treatment because of its obvious advantages including the ease of use, limited or complete avoidance of maxillo-mandibular fixation, precise anatomical reduction, functional stability and improved mouth opening.

CONCLUSION

Road traffic accidents are the most common reason for maxillofacial injuries in our set up. Therefore,

masses should be educated regarding road safety, use of seatbelts and restraints, and use of helmets while on motor-bikes. Changes should be made in legislature to ensure strict compliance of traffic safety rules.

REFERENCES

1. Aksoy E, Ünlü E, Sensöz Ö. A retrospective study on epidemiology and treatment of maxillofacial fractures. *J Craniofac Surg.* 2002; 13: 772-5.
2. Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jönsson B, et al. The size and burden of mental disorders and other disorders of the brain in Europe 2010. *Eur Neuropsychopharmacol.* 2011; 21: 655-79
3. Wood EB, Freer TJ. Incidence and aetiology of facial injuries resulting from motor vehicle accidents in Queensland for a three-year period. *Aust Dent J.* 2001; 46: 284-8
4. Ribeiro M, Marcenés W, Croucher R, Sheiham A. The prevalence and causes of maxillofacial fractures in patients attending Accident and Emergency Departments in Recife-Brazil. *Int Dent J.* 2004; 54: 47-51.
5. Brasileiro BF, Passeri LA. Epidemiological analysis of maxillofacial fractures in Brazil: a 5-year prospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006; 102: 28–34
6. Haug RH, Prather J, Indresano AT. An epidemiologic survey of facial fractures and concomitant injuries. *J Oral Maxillofac Surg* 1990; 48: 926–32
7. West P, Reeder A I, Milne B J, Poulton R. Worlds apart: a comparison between physical activities among youth in Glasgow, Scotland and Dunedin, New Zealand. *Soc Sci Med* 2002; 54: 607–19
8. Kieser J, Stephenson S, Liston PN, Tong DC, Langley JD. Serious facial fractures in New Zealand from 1979 to 1998. *Int J Oral Maxillofac Surg* 2002; 31: 206–209
9. Erol B, Tanrikulu R, Görgün B. Maxillofacial Fractures. Analysis of demographic distribution and treatment in 2901 patients (25-year experience). *J Craniomaxillofac Surg.* 2014; 32: 308-13.
10. Moncrieff NJ, Qureshi C, Deva AK. A comparative cost analysis of maxillofacial trauma in Australia. *J Craniomaxillofac Surg.* 2004; 1: 686-91.
11. Adebayo E, Ajike O, Adekeye E. Analysis of the pattern of maxillofacial fractures in Kaduna, Nigeria. *Br J Oral Maxillofac Surg.* 41: 396-400
12. Subhashraj K, Ramkumar S, Ravindran C. Pattern of mandibular fractures in Chennai, India. *Br J Oral Maxillofac Surg.* 2008; 46: 126-7
13. Taher AA. Management and complications of middle and upper third facial compound injuries: An Iranian experience. *J Craniofac Surg.* 1993; 4: 153-61.
14. Haug RH, Adams JM, Conforti PJ, Likavec MJ. Cranial fractures associated with facial fractures: A review of mechanism, type, and severity of injury. *J Oral Maxillofac Surg.* 1994; 52: 729-33.
15. Tanaka N, Tomitsuka K, Shionoya K, Andou H, Kimijama Y, Tashiro T, et al. Aetiology of maxillofacial fractures. *Br J Oral Maxillofac Surg.* 1994; 32: 19-23.
16. Cabrini Gabrielli MA, Real Gabrielli MF, Marcantonio E, Holuchi-Vieira E. Fixation of mandibular fractures with 2.0 mm miniplates: Review of 191 cases. *J Oral Maxillofac Surg.* 2003; 61: 430-6.
17. Dimitroulis G, Eyre J. A 7-year review of maxillofacial trauma in a central London hospital. *Br Dent J.* 1991; 20: 170: 300-2.
18. Oikarinen K, Igratius E, Kauppi H. Mandibular fractures in northern Finland in the 1980's: A 10 year study. *Br J Oral Maxillofac Surg.* 1993; 31: 23-7.
19. Lee MC, Chin WT, Chang LT, Liu SC, Lin SH. Craniofacial injuries in un-helmeted riders of motorbikes. *Injury* 1995; 26: 467-70.
20. Iida S, Kogo M, Sugiura T, Mima T, Matsuya T. Retrospective analysis of 1502 patients with facial fractures. *Int J Oral Maxillofac Surg* 2001; 30: 286-90.
21. Lee K. Global trends in maxillofacial fractures 2012; 5: 213-22.
22. Cabalag MS, Wasiak J, Andrew NE, Tang J, Kirby JC, Morgan DJ. Epidemiology and management of maxillofacial fractures in an Australian trauma centre. *J Plast Reconstr Aesthet Surg.* 2014; 67: 183-9.
23. Mohajerani SH, Asghari S. Pattern of mid-facial fractures in Tehran, Iran. *Dent Traumatol.* 2011; 27: 131-4.
24. Momeni H, Shahnasari S. Distribution assessment of maxillofacial fractures in trauma admitted patients in Yazd hospitals: An epidemiologic study. *Dent Res J (Isfahan).* 2011; 8: 80-3.
25. vanHout WM, Van Cann EM, Abbink JH, Koole R. An epidemiological study of maxillofacial fractures requiring surgical treatment at a tertiary trauma centre between 2005 and 2010. *Br J Oral Maxillofac Surg.* 2013; 51: 416-20.
26. Hussain K, Wijetunge DB, Grubnic S, Jackson IT. A comprehensive analysis of craniofacial trauma. *J Trauma.* 1994; 36: 43-7.
27. Motamedi MHK. An assessment of maxillofacial fractures: a 5-year study of 237 patients. *J Oral Maxillofac Surg.* 2003; 61: 61-4.
28. Ansari MH. Maxillofacial fractures in Hamedan province, Iran: a retrospective study (1987–2001). *J Craniomaxillofac Surg.* 2004; 32: 28-34.