

MAXILLOFACIAL FRACTURES: ANALYSIS OF DEMOGRAPHIC DISTRIBUTION IN 320 PATIENTS

*AMJAD SHAH, FCPS (Pak)

**ADNAN ALI SHAH, MDS (UK), FRACDS (Aus), FDSRCS

(London) ***ABDUS SALAM, MDS, FCPS (Pak)

ABSTRACT

The descriptive study was undertaken to analyze the demographic distribution of maxillofacial fractures in 320 patients reported to the department of Oral & Maxillofacial Surgery de, Montmorency College of Dentistry, Punjab Dental Hospital, Lahore from June 2001 to Dec 2002. A review of patients records and radiographs was conducted. Data regarding age, gender and cause of fracture were reviewed. The age range was 2-76 years (mean 25 yrs) with peak frequency occurring in age group 21-30 yrs. The male to female ratio was 5.4:1. The study indicated that 64.7% (n=206) resulted from road traffic accidents (RTAs) followed by fall (n=60; 18.8%), assault (n=26; 8.1%), sports (n=17; 5.3%), firearm injury [FM (n=3; 0.9%)], industrial trauma (n=2; 0.6%) while 5 cases (1.65%) were associated with other causes such as bomb blast, animal injury etc. This study can provide a guide to the design of programs geared toward prevention and treatment.

Key words: Trauma, facial fractures, etiology, road traffic accidents.

INTRODUCTION

The face, as most exposed part of the body, is particularly vulnerable to trauma.¹ The main causes world wide are road traffic accidents, falls, assaults, sports, fire arm injuries and industrial trauma.^{2,3} Clearly the etiology would be expected to influence the degree and type of injury sustained.⁴ Data collected from 1960s and early 1970s have indicated that 20%-60% of all people injured in R.T.As has some degree of maxillofacial injury.⁵ A high incidence of maxillofacial injuries due to R.T.As is reported in developing nations^{6,7}, while incidence due to personal violence is more in developed countries.^{8,9} Introduction of compulsory seat belts and drink-drive legislation^{10,11} have significantly reduced both the number and severity of injuries sustained

following road traffic accidents by 25%, and the more serious facial injuries reduced in severity by two-third.¹² It is found that falls were the 2nd most common cause after assault though it is recognized that many patients who have assaulted reported that their injuries were due to falls.⁴ The constant improvement in the quality of individual life and growing interest in sporting activities have resulted in an increased use of sport in free time at amateur level. As a result, sports injuries have steadily increased since the late 1980s.¹³ Maxillofacial trauma due to fire arm injuries have been increasing during the past decades, being one of the greatest challenges for oral maxillofacial surgeons.¹⁴ Greater industrial trauma is reported in industrialized cities.

* Oral & Maxillofacial Surgeon, Dentistry Department PGMI/ Govt Lady Reading Hospital, Peshawar.

** Professor & Head Department of Oral & Maxillofacial Surgery de, Montmorency College of Dentistry, Punjab Dental Hospital, Lahore

*** Professor & Head Department of Oral & Maxillofacial Surgery/ Principal Khyber College of Dentistry, Peshawar.

Correspondence: Dr Amjad Shah, Oral & Maxillofacial Surgeon, Dentistry Department, PGMI/ Govt Lady Reading Hospital, Peshawar. Cell no: 0333-9107122, [E-Mail: amjadshahsyed@yahoo.com](mailto:amjadshahsyed@yahoo.com)

Age and sex have been cited as important factors that influence the occurrence of maxillofacial injuries." The highest incidence is seen in the age group 21-30 years.^{15,16} The lowest incidence is observed in the age group above 60 years and below 5 years. Most of the patients are male with a male: female ratio of approximately 3:1.¹⁷

Over the past 100 years Major developments have been made in the care of victims of maxillofacial trauma such as external skeletal fixation, open reduction, craniofacial exposure, internal wire fixation, primary bone grafting, miniplates and orbital reconstruction. Therefore, such injuries adversely affects the quality of life less frequently today than once did, due to the advances that have been made by countless individuals from diverse disciplinary backgrounds. Collectively, these advances have provided great improvement in the primary and secondary correction of traumatic maxillofacial deformities.

MATERIALS AND METHODS

The information obtained was based upon analysis of maxillofacial injuries recorded from the department of oral & maxillofacial surgery, de, Montmorency College of Dentistry, Lahore. The study was conducted from June 2001 to Dec 2002. This randomized study was conducted on 320 consecutive patients as having received maxillofacial injuries. All patients of any age and either sex presenting with maxillofacial trauma to the department were included in the study. A detailed history of the patient was taken and thorough clinical examination was carried out. Basic investigations and specific investigations like radiograph were carried out to confirm the bony trauma. The maxillofacial fractures were assessed according to the etiology, age, and gender.

RESULTS

During the period from June 2001 to Dec 2002, 320 patients with different types of maxillofacial fractures were treated. The most common cause of maxillofacial trauma was RTAs (n=207; 64.7%), followed by accidental fall (n=60; 18.8) and injuries associated with fight (n=26; 8.1%); sports related injuries in 17 cases (5.3%). FAI (n=3: 0.9%) Industrial (n=2: 0.6%). The causes of injuries are listed in table 1. The remaining fractures were due to a variety of causes (n=5: 1.6%) such as bomb blast, animal injury etc.

The age of patient at the time of injury ranged from 2-76 years, with a mean age of 25 years +1- 13 years. In most cases the patient was between the age of 21-30 years (n=105;32.8%). Only 12.8% of patients were less than 11 years of age, and 1.3% were more than 60 years of age (table 3). In virtually all age groups, more men than women were affected, the overall ratio being 5.4:1 (table 2).

TABLE 1: DISTRIBUTION OF MAXILLOFACIAL FRACTURES ACCORDING TO ETIOLOGY

	Number of cases	Percent
RTA	207	64.7
Fall	60	18.8
Assault	26	8.1
Sports	17	5.3
FAI	3	0.9
Industrial	2	0.6
Other Causes	5	1.6
Total	320	100.0

TABLE 2: GENDER DISTRIBUTION OF MAXILLOFACIAL FRACTURES

	Number of cases	Percent
Male	270	84.4
Female	50	15.6
Total	320	100.0

TABLE 3: DISTRIBUTION OF MAXILLOFACIAL FRACTURES ACCORDING TO AGE

Age (years)	Number of cases	Percent
1-10	41	12.8
11-20	92	28.8
21-30	105	32.8
31-40	50	15.6
41-50	20	6.3
51-60	8	2.5
Over 60	4	1.3
Total	320	100.0

DISCUSSION

The result of epidemiological surveys on the causes and incidence of maxillofacial fractures tend to vary with geographic region, socioeconomic status, culture, religion and era.^{18,19} The predominance of maxillofacial

trauma in the age group 21-30 years is consistent with the findings of previous published work. But contrasts with the report of Karyouti,²⁰ who gave the age group of 0-5 years as having the highest incidence. The possible explanation for the high frequency of the 21-30 year age group is that people in this age group take part in dangerous exercises and sports, drive motor vehicles carelessly, and are most likely to be involved in violence. The lowest frequency was observed in the age group above 60 years (1.3%) contrary to the study of Kapoor and Srivastava²¹ in which it was 0-5 years. The limited outdoor activities in old age would be the possible reason.

Previous studies have shown a lower incidence of maxillofacial fractures in females with male, female ratios ranging from 5.2:1 to 5.4:1. In this study it remained 5.4:1.³ The higher age of man could be because men are mostly involved in outdoor activities and are also exposed to violent interaction. Male drivers are more as compared to female.

In most previous epidemiological studies traffic accidents were the most common cause of mandibular fractures,^{1,3} and the present study supports these findings. In England it has been reported that the introduction of the compulsory use of seat belts is having a significant effect with respect to reducing the number of facial injuries.^{22,23} In Pakistan a law making the use of seat belts compulsory has not been implemented properly. While interviewing the victims of facial trauma due to RTAs, it was observed that the carelessness of many drivers, failure to give the right of way, excessive speed on highways for competition among addict drivers, were responsible for increase in number of mandibular fractures due to R.T.As.

Hill et al²⁴ and Voss²⁵ reported assault as the predominant cause of maxillofacial fractures in England and Norway, respectively. The frequency of 8.1% in this study caused by fighting contrast vividly with the figure of 55% reported from Scotland,⁴ a finding that may be related to differences in social customs alcohol intake. Because of religious background, Pakistanis do not drink alcohol.

CONCLUSION

The present study revealed that the peak frequency of mandibular fractures occurred in the age

group consisting of 21-30 years old and most frequent cause was R.T.As (64.7%). The male to female ratio was 5.4:1. The body of mandibular fractures (30.3%) was the most frequent site followed by condyler region (24.2%).

The findings show that there are causes of concern about the high rate of mandibular injuries caused by R.T.As, as few people use safety belts, an awareness campaign to educate the public especially drivers about the importance of restraints and protective measures in motor-vehicles, should be implemented. These finding should alert the authorities to the need for the enforcement of existing traffic laws to control excessive speed on highways and careless driving, provision of smooth roads and use of safety belts must be made compulsory.

REFERENCES

- 1 Oji C. Jaw fractures in Enugu, Nigeria, 1985-95. *Br J Oral Maxillofac Surg* 1999; 37:106-9
- 2 Telfer MR, Jones GM, Shepherd JP. Trends in the etiology of maxillofacial fractures in the United Kingdom (1977-1987). *Br J Oral Maxillofac Surg* 1991; 29: 250.
- 3 Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 86: 31.
- 4 Adi M, Ogden G R, Chisholm D M. An analysis of mandibular fractures in Dundee, Scotland (1977 to 1985). *Br J Oral Maxillofac Surg* 1990; 28:194-99.
- 5 Nahum AM, Siegel AW, Brooks S. The reduction of collision injuries, past, present, and future. In: *proc 14th STAPP Car Conference*, New York: Society of Automobile Engineers, 1970:1-43.
- 6 Ajagbe HA, Daramola JO. Pattern of facial bone fractures seen at the University College Hospital Ibadan, Nigeria. *East Afr Med J* 1980; 57:267-72.
- 7 Khalil AF, Shaladi OA. Fractures of facial bones in the eastern region of Libya. *Br J Oral Surg* 1981; 19: 300-5.
- 8 Nakamura T, Gross CW. Facial fractures: analysis of five years of experience. *Arch Otolaryngol* 1973; 21: 288-93.
- 9 Thorn JJ, Mogeltoft M, Hansen PK. Incidence and aetiological pattern of jaw fractures in Greenland. *Int J Oral Maxillofac Surg* 1986; 15: 372-79.
- 10 Homel R, Castledene D, Kearns I. Drink-driving counter measures in Australia. *Alcohol Drugs Driving* 1988; 4: 33-44.
- 11 Tunbridge R. The long-term effect of seat-belt legislation on road user injury patterns. *Health Bull* 1990; 48: 347-49.
- 12 Peter B. *Killey's fracture of the middle third of the facial skeleton*. 5th ed. London: Butter Worth; 1987: 26.
- 13 De Giovanni PP, Mazzeo R, Servadio F. Sport's activities and maxillofacial injuries. Current epidemiologic and clinical aspects relating to a series of 379 cases (1982-1998). *Minerva Stomatol*. 2000; 49:21-6.

- 14 Cardoso R, Salgado C, Pitta M. Low velocity gunshot wounds in the maxillofacial area: preliminary evaluation of 24 cases. *Int J Oral Maxillofac Surg* 1999; 4: 79
- 15 Nasreen A An analysis of maxillofacial fractures in AKUH. *Pakistan J Surg* 1993; 9: 128-32.
- 16 Motamedi MH. An assessment of maxillofacial fractures: a 5-year study of 237 patients. *J Oral Maxillofac Surg* 2003; 61:61-4
- 17 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.
- 18 Tanaka N, Tomitsuka, Shionoya K, Andou, Kimjim Y, Tashiro T, et al. Aetiology of maxillofacial fractures. *Br J Oral Maxillofac Surg* 1994; 32:19-23.
- 19 Haung RH, Prather J, Indrsano T, An epidemiological Survey of facial fractures and concomitant injuries. *J Oral Maxillofac Surg* 1990; 48:226-32.
- 20 Karyouti SM. Maxillofacial injuries in Jordan University Hospital. *Int J Oral Maxillofac Surg* 1982; 10:146-8.
- 21 Kapoor AL, Srivastava AB. Maxillofacial trauma, an international perspective. *Int J Oral Maxillofac Surg* 1984; 13:27-34.
- 22 Roberts AH, Carroll MJ, Lamb RL. Windscreen injuries and seat belt. *Lancet* 1983; 845:340.
- 23 Steele RJ, Little K. Effect of seat belt legislation. *Lancet* 1983; 845:341.
- 24 Hill CM, Crosher RF, Carroll MJ, Mason DA. Facial fractures: the results of a prospective four years study. *J Maxillofac Surg* 1984; 12:267-70.
- 25 Voss R. The etiology of jaw fractures in Norwegian patients. *J Maxillofac Surg* 1982; 10:146-8.
- 26 Erol B, Tanrikulu R, Gorgun B. Maxillofacial fractures. Analysis of demographic distribution and treatment in 2901 patients (25-year experience). *J Craniomaxillofac Surg* 2004, 32 (5): 308-13
- 27 Qudah MA, Al-Khateeb T, Bataineh AB, Rawashdeh MA.. Mandibular fractures in Jordanians: a comparative study between young and adult patients. *J Craniomaxillofac Surg*. 2005, 33(2): 103-6.
- 28 Al Ahmad HE, Jaber MA, Abu Fanas 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 Radiol Endod* 2004, 98(2): 166-70.
- 29 Holmes PJ, Koehler J, McGwin G Jr, Rue LW 3'd. Frequency of maxillofacial injuries in all-terrain vehicle collisions. *J Oral Maxillofac Surg* 2004, 62(6): 697-701
- 30 Ferreira PC, Amarante JM, Silva AC, Pereira JM, Cardoso MA, Rodrigues JM. Etiology and patterns of pediatric mandibular fractures in Portugal: a retrospective study of 10 years. *J Craniofac Surg* 2004, 15(3): 384-91
- 31 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.
- 32 Klenk G, Kovacs A. Etiology and patterns of facial fractures in the United Arab Emirates. *J Craniofac Surg* 2003,14(1): 78-84
- 33 Motamedi MH. An assessment of maxillofacial fractures: a 5-year study of 237 patients *J Oral Maxillofac Surg* 2003, 61(1): 61-4
- 34 Fasola AO, Obiechina AE, Arotiba JT. Incidence and pattern of maxillofacial fractures in the elderly. *Int J Oral Maxillofac Surg* 2003, 32(2): 206-8
- 35 Aksoy E, Unlu E, Sensoz O. A retrospective study on epidemiology and treatment of maxillofacial fractures. *J Craniofac Surg* 2002, 13(6): 772-5.