

The maxillofacial injuries: A postmortem study

ABSTRACT

Objectives: The aim of our study is to evaluate the incidence and etiology of maxillofacial fractures in autopsy cases of KGMU, Lucknow.

Materials and Methods: The sample consisted of 444 autopsy cases with maxillofacial injuries, who were brought to the mortuary of KGMU, Lucknow, for postmortem in the last year. Parameters such as gender, age, cause, type, and site of injury are evaluated.

Result: The results of this study show that road traffic accidents are the main reason for maxillofacial injuries in the deceased, followed by railway accidents. Maxillofacial injuries are more common in adult males than in females. Majority cases also involved maxilla and zygomatic along with mandible. The most common type of facial fracture was Le Fort-2 fracture.

Conclusion: Maxillofacial injuries are commonly seen in adult males, due to RTA, involving maxilla, zygomatic and mandible and presenting as Le Fort-2 fracture.

Keywords: Maxillofacial injuries, railway accidents, road traffic accidents

INTRODUCTION

Sushruta, known as father of Indian Plastic Surgery, described an array of facial injuries and performed a rhinoplasty, the oldest plastic surgery operation in 600 BC. The injuries to the facial regions are highly significant for many reasons. Facial region provides anterior protection for the cranium and plays important role in its appearance also. Maxillofacial region is associated with a number of important functions of the daily life like-vision, smell, breathing, eating, and speaking. These functions are severely affected and ultimately result in poor quality of life in survivors.

Facial injuries are seen in significant proportion in trauma patients requiring prompt diagnosis and treatment, but majority of them usually prove to be fatal due to their serious complications or associated skull, brain, and cervical injuries. Maxillofacial injuries are commonly occur both in war and peace. The number of maxillofacial injuries is continuously increasing due to rise in day-to-day traffic, and failure to take preventive measures in the traffic leads to road traffic accidents (RTAs), and railway accidents.

The aim of this study was to find out the incidence and pattern of maxillofacial injuries resulting from various etiological factors. Because of its anatomical significance, the maxillofacial

injuries remain serious clinical problems as important organs are also located in this area. Due to anatomical proximity together with maxillofacial injuries, the damage to the eyes and central nervous system may occur and injuries in this region can result in serious dysfunction and death. This descriptive, analytical study assesses the etiology, type, and demography of all maxillofacial fracture cases brought to our mortuary for autopsy purpose in the last 1 year.

MATERIALS AND METHODS

The sample consisted of 444 autopsy cases with

**RAJA RUPANI, MOUSAMI SINGH, VIJAY KUMAR¹,
RAGHVENDRA SINGH, SACHIL KUMAR²,
PRADEEP YADAV**

Departments of Forensic Medicine and Toxicology and ¹Plastic Surgery, KGMU, Lucknow, Uttar Pradesh, ²Department of Forensic Chemistry, College of Forensic Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

Address for correspondence: Dr. Raja Rupani,
Department of Forensic Medicine and Toxicology, KGMU, Lucknow,
Uttar Pradesh, India.
E-mail: rajarupani68@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Rupani R, Singh M, Kumar V, Singh R, Kumar S, Yadav P. The maxillofacial injuries: A postmortem study. Natl J Maxillofac Surg 2018;9:48-51.

Access this article online	
Website: www.njms.in	Quick Response Code 
DOI: 10.4103/0975-5950.233295	

maxillofacial injuries, which were brought to the mortuary of KGMU, Lucknow, for postmortem purpose during the last 1 year (from July 2015 to June 2016).

The study was done on the basis of history obtained from the relatives or attendants and gross examination done during autopsy.

The parameters to assess included age, sex, etiology, fractured bones, involved areas, types of facial fractures, and other associated fractures.

RESULTS

In our study, ratio between male and female was 7:3 [Table 1]. The age group which was most commonly involved was 21-30 (34.90%) years, followed by 31-40 years (25.0%) while the least common age group involved was 0–10 years of age [Table 2]. The RTA (56.75%) was found to be the most common etiological factor, followed by railway accidents (29.72%) while fall from height was the least common age group involved in our study (2.70%) [Table 3]. Most of the patients had facial fractures including multiple bones like-mandible, maxilla, and zygomatic complex fracture (52.70%) followed by orbital floor fracture (13.73%) [Table 4 and Figure 1]. Among maxillary fractures, Le Fort 2 fracture was the most common fracture (54.27%) followed by Le Fort 3 and then Le Fort 1 [Table 5]. The most common bone fractures associated with maxillofacial fractures were seen in skull bones of 352 (79.27%) cases, followed by cervical spine fractures in 102 (22.97%) cases [Table 6]. In our study, driver of two wheelers (38.8%), followed by pedestrian (27.38%) are the most prone victims of maxillofacial injury during RTA [Table 7].

DISCUSSION

In our study, we found that males are more prone for trauma because of their outdoor works, rash driving tendencies, and alcoholism^[1-3] while females are still reserved and deal with the household work and remained confined to indoors mainly. Male also have more likely to own a vehicle than their female counterpart. Other regions of world too reported the similar prevalence.^[4] In our study, the most common age group affected was 21–40 years (67.31%). The more frequent involvement of 21–40 year age group may be due to their involvement increased in traveling to workplace and outdoor activities. Other studies also shows similar result.^[5] The other causes of increased incidence of accidents in this age group may be their risk-taking behavior such as drinking

Table 1: Gender (n=444)

Gender	Number of cases (%)
Male	320 (72.07)
Female	124 (27.93)

Table 2: Age group (n=444)

Age group	Number of cases (%)
0-10	13 (2.90)
11-20	27 (6.08)
21-30	155 (34.90)
31-40	111 (25.00)
41-50	35 (7.88)
51-60	18 (4.05)
61-70	20 (4.50)
71-80	45 (10.13)
81-90	20 (4.50)

Table 3: Etiology

Factors	Number of cases (%)
Road traffic accidents	252 (56.75)
Railway accidents	132 (29.72)
Fall from height	12 (2.70)
Assault	25 (5.63)
Firearm injury	23 (5.18)

Table 4: Fracture involving different bones (n=444)

Bones	Number of cases (%)
Mandible + maxilla + zygoma (complex)	234 (52.70)
Maxilla	32 (7.20)
Zygomatic complex	36 (8.10)
Nasoorbito ethmoid	46 (10.36)
Orbital floor	61 (13.73)
Frontal	35 (7.88)

Table 5: Maxilla fractures

Site	Number of cases (%)
Le Fort 1	74 (16.66)
Le Fort 2	241 (54.27)
Le Fort 3	129 (29.05)

Table 6: Associated fractures

Site	Number of cases (%)
Skull	352 (79.27)
Cervical spine	102 (22.97)
Upper limb	81 (18.24)
Lower limb	79 (17.79)
Other fractures	28 (6.30)



Figure 1: Complex fracture

Table 7: Maxillofacial injury in road traffic accidents

Causes	Number of cases (%)
Cars	31 (12.30)
Two wheelers	98 (38.8)
Cyclists	42 (16.6)
Pedestrians	69 (27.38)
Others	12 (4.76)

along with the lack of knowledge or in most of the cases, violation of traffic rules. In contrast to a study performed by Siber *et al.*, where fall from height was the most common cause of oromaxillofacial injuries in both men and women, we found that RTAs continue to be one of the leading cause of maxillofacial fracture in our study.^[6] High population burden on road, over speeding, and drinking either alone or in combination are major contributory factors in occurrence of RTAs. Adeyemo *et al.* also found that RTAs remains as the major cause of maxillofacial injuries, unlike most of the developed countries where interpersonal violence/assaults, have now replaced RTAs as to be the major cause of the injuries.^[7,8] This study shows that the most common cause of facial injuries was found to be RTAs, which is consistent with the observations of other studies in India and also of other countries^[3-5,9,10] followed by railway accidents which is due to negligence of vehicle drivers on railway crossings or often due to overloading of trains, specially falling while traveling on tops of railway bogies. The most common fracture observed in this study is involvement of mandible, maxilla, and zygomatic complex fracture. Bony prominences of the face are most prone areas for maxillofacial injury. Similar to our postmortem study, Motamedi *et al.*,^[10] also found higher number of (72.9%) mandibular, (24.0%) zygomatico-orbital, (13.9%) maxillary, and (13.5%) injuries. In our scenario similar to Motamedi,^[10] in our postmortem study, we also reported Le Fort 2 to be the most common type of maxilla fracture. In contrast to the

study of Austria where only one-fifth of all patients displayed concomitant injuries with cranial trauma, we found this in approximately two-third cases.^[11] Due to lack of safety measures such as wearing a helmet during driving and rash driving, cranial injuries are most common associated injuries. According to the WHO estimates, nearly 25% of all worldwide injury fatalities are due to road traffic crashes, and 90% of fatalities occur in low- and middle-income countries.^[7] RTAs have been steadily falling in the developed countries, but they still continue to rise with the horrifying speed in the low- and middle-income countries of Africa and Asia. It is also one of the major causes of death in India. The majority of the accidents results due to speeding, rash driving, and traffic rules violation. Alcoholism is globally associated with RTAs. Besides overloading and rash driving, fatigue is another important factor for road accidents, especially in commercial vehicle drivers who drive very long distances. There is also important role of bad road conditions in RTA but some studies reported even more of the RTAs on well paved and broad roads.^[12] Higher population density, especially of migrants who settled along the roadside in metro cities for search of work and food like rickshaw puller, are more prone victim for RTA.^[13] Similar to the study of other parts of India, we also found two-wheeler drivers, followed by pedestrian are most common victim of maxillofacial injury in RTA cases.^[14] Unawareness of traffic signals, listening music while walking by using earphone, ignoring traffic rules, bad road conditions, and rash driving are some common mistakes, which make them more prone for RTA.

CONCLUSIONS

The results of these study show that RTAs are the main reason for maxilla facial injuries followed by railway accidents. Maxillofacial injuries are more common in males than in females. The mandible was most frequently involved facial bone. Injury prevention and safety in developing countries must be based on local evidence and research and designed to suit the social, moral, and economic circumstances of the public of that particular country.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Back CP, McLean NR, Anderson PJ, David DJ. The conservative management of facial fractures: Indications and outcomes. *J Plast Reconstr Aesthet Surg* 2007;60:146-51.
2. Gassner R, Tuli T, Hächl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: A 10 year review of 9,543 cases with 21,067 injuries. *J Craniomaxillofac Surg* 2003;31:51-61.
3. Gupta R, Suryanarayan S, Sharma A, Pandya V, Sathaye S. Traumatic mandibular fractures: Pendulum towards closed reduction. *World Artic Ear Nose Throat* 2010;3:1-3.
4. Obuekwe ON, Ojo MA, Akpata O, Etetafia M. Maxillofacial trauma due to road traffic accidents in Benin City, Nigeria: A prospective study. *Ann Afr Med* 2003;2:58-63.
5. Agnihotri A, Galfat D, Agnihotri D. Incidence and pattern of maxillofacial trauma due to road traffic accidents: A prospective study. *J Maxillofac Oral Surg* 2014;13:184-8.
6. Siber S, Matijevic M, Sikora M, Leovic D, Mumlek I, Macan D. Assessment of oro-maxillofacial trauma according to gender, age, cause and type of the injury. *Acta Stomatol Croat* 2015;49:340-7.
7. Adeyemo WL, Ladeinde AL, Ogunlewe MO, James O. Trends and characteristics of oral and maxillofacial injuries in Nigeria: A review of the literature. *Head Face Med* 2005;1:7.
8. Deliverska E, Rubiev M. Patterns of maxillofacial injuries in university hospital 'st. Anna', sofia journal of imab - Annual Proceeding (Scientific Papers) 2012;18:150-2.
9. El-Degwi A, Mathog RH. Mandible fractures – Medical and economic considerations. *Otolaryngol Head Neck Surg* 1993;108:213-9.
10. Motamedi MH. An assessment of maxillofacial fractures: A 5-year study of 237 patients. *J Oral Maxillofac Surg* 2003;61:61-4.
11. Hächl O, Tuli T, Schwabegger A, Gassner R. Maxillofacial trauma due to work-related accidents. *Int J Oral Maxillofac Surg* 2002;31:90-3.
12. Al Ahmed 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;98:166-70.
13. Singh R, Singh M, Rupani R, Verma AK, Singh H, Kumar S, *et al.* A comparative study on the death of unclaimed homeless males and females based on autopsy and circumstantial findings in a large North Indian population. *J Public Health* 2015;23:333.
14. Ruikar M. National statistics of road traffic accidents in India. *J Orthop Traumatol Rehabil* 2013;6:1-6.