

PATTERN OF MOTORCYCLE RELATED MAXILLOFACIAL INJURIES IN PATIENTS PRESENTING TO A TERTIARY CARE HOSPITAL IN PAKISTAN: A CROSS-SECTIONAL STUDY

Nadia Ashraf¹, Fahimuddin², Khadim Shah², Sardar Muhammad², Asif Kamal², Ayesha Siraj²

¹Assistant Professor, Oral and Maxillofacial Surgery, Peshawar Dental College

²Associate Professor, Oral and Maxillofacial Surgery Khyber Girls Medical College/Hayatabad Medical Complex Peshawar

ABSTRACT

Objectives: To analyze the pattern of maxillofacial injuries and associated concomitant injuries received by a motorcyclist.

Methods and materials: This descriptive (cross-sectional) study carried out at the Oral and Maxillofacial Surgery Unit of Hayatabad Medical Complex, Peshawar from 4th December, 2019 to 20th February 2021. A total of 386 patients having road traffic accidents were included in the study regardless of age and gender. Every patient was examined both clinically and radiographically to confirm the site of maxillofacial fracture.

Results: Majority of the patients were involved in motorbike accidents (79%) among the patients injured in road traffic accidents. More than two third of the patients were young males (76%) as compare to females (24%). Out of 304 patients who sustained maxillofacial trauma during motor bike accidents, only a minority of victims 38(12.5%) used helmets while the remaining did not. The most common fractured site was mandible (46.7%).

Conclusion: Most of the patients encountered in the present study were young males without helmets and mandible being the most frequent site.

Key words: motor bike accident, helmet, mandible

INTRODUCTION

Trauma is usually considered as the main etiological factor responsible for death in individuals younger than forty years. As head and face are the most prominent parts of human body, they are at more risk for both skeletal and soft tissue injuries.¹ Maxillofacial injuries lead to long term consequences and have significant impact on the patient's psychology, esthetics and function.² Moreover, these injuries need proper attention during diagnosis and treatment due to their close anatomical position to the brain and association with serious complications

like traumatic brain injury.³

Traffic accidents specially motorcycle related injuries are the most common cause of maxillofacial trauma in developing countries.^{3,5,6,7}

The motorbike is considered as the most threatening motor vehicle because a motorcyclist is 34 times more likely to die in an accident as compare to people driving other types of automobiles. The risk of non-fatal injury is also 8 times more per vehicle mile than four wheeler occupants.^{4,8,9} Besides this, a motorcycle driver usually suffer multiple injuries and the severity of head injury is proportionately more severe as compare to person receiving trauma due to other causes.¹⁰

Maxillofacial injuries due to motorcycle usually involve young males who have the highest fatality rates of any age group because of their less

Correspondence:

Dr. Fahimuddin

Associate Professor Oral and Maxillofacial Surgery, Khyber Girls Medical College/Hayatabad Medical complex, Peshawar, KPK, Pakistan

Cell: +92-333-8737733

Email: fahim79pk@yahoo.com

experience, careless behavior and driving without helmet.⁴ It has been reported that helmet decreases both morbidity and mortality and also improve the outcome. The risk of death and craniofacial injury is reduced almost 40% by using a standard good quality helmet.^{11,12,13}

Motorcycle related trauma has become a major public health problem throughout the world particularly in developing countries. These injuries result in huge economic burden on the society because of the high cost involved in treatment and rehabilitation of such patients.¹⁴

There is no previous published work on the subject from this part of the country and institution, which is a tertiary care center dealing with a large number of such trauma patients. Therefore, the present study was designed to analyze the pattern of maxillofacial injuries and associated concomitant injuries received by a motorcyclist. The findings are not only a good tool for advocacy with the policy makers but can also be used to increase awareness about safety while driving to reduce and prevent such accidents and injuries.

MATERIALS AND METHODS

This is a descriptive (cross-sectional) study carried out at the Oral and Maxillofacial Surgery unit of Hayatabad Medical Complex, Peshawar from 4th December, 2019 to 20th February 2021. A total of 386 patients having road traffic accidents were included in the study regardless of age and gender. Permission was taken from the institutional research ethical committee. After taking informed consent from each patient, a comprehensive history and thorough head to toe clinical examination was carried out. Ortho Pantomogram (OPG), Occipito-mental view and Posteroanterior view of the face (PA face) was advised to every patient to confirm the site of maxillofacial fracture. Computed tomography scan and 3D Computed tomographic scan and cone beam computed tomography scan was also advised in some selected patients.

The collected data was recorded on a specially designed performa and was analyzed using SPSS and then presented in the form of tables and charts.

RESULTS

A total of 386 trauma patients were recruited in

the study. Among these, 304 (79%) patients were involved in motorbike accidents among all trauma patients.

More than two third of the patients were males (76%) as compare to females (24%). The male to female ratio was 3.2:1 (Figure 2)

The mean age of the patients recorded was 24 years with a minimum age of 5 years and maximum age of 60 years. Individuals between the ages of 21 to 30 years were most commonly injured. (Table 1)

Out of 304 patients who sustained maxillofacial trauma during motor bike accidents, only a minority of victims 38(12.5%) used helmets while the remaining did not. (Figure 3)

According to our analysis, the most prevalent maxillofacial fracture site was mandible accounting for 46.7% of total injuries followed by zygoma 34%. All patients sustained soft tissue injuries. (Table 2)

DISCUSSION

Facial trauma besides imposing serious injuries

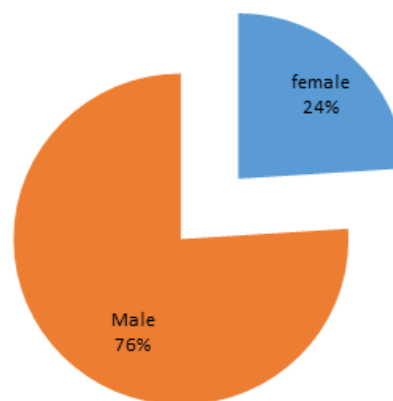


Figure 1: Gender distribution of the patients

Table No.2: Age distribution

S no.	Age in years	Count	Percentage
1	0 to 10	07	2.3%
2	11 to 20	84	27.6%
3	21 to 30	137	45%
4	31 to 40	42	13.8%
5	41 to 50	21	7%
6	51 to 60	13	4.3%
Total		304	100%

Table 3: Use of helmet while riding a motorbike

	Helmet use	% injuries
1.	With helmet	12.5
2.	Without helmet	87.5

Table 4: Distribution of facial bone involvement in motor-bike accident patients

S.No	Fractured bone	Number of patients	Percentage
1	Mandible	142	46.7%
2	Zygoma	103	34%
3	Maxilla	27	8.9%
4	Nasal bone	12	3.9%
5	Orbit	12	3.9%
6	Frontal bone	6	1.9%
7	NOE	2	0.7%
Total:		304	100%

to the victim, it also leads to a significant burden on the society as well due to associated mortality, morbidity and costly treatment. The incidence, cause and pattern of maxillofacial injuries is different in different parts of the world because of environmental and life style variations among people.³

In 2020, the deaths due to road traffic accidents was considered third most significant health issue in non-developed countries.¹⁴ It is expected that if preventive measures are not taken, the road traffic crashes will emerge as the fifth leading cause of death by 2030¹⁵. In present study, a major proportion of RTA patients were related to motor vehicle accidents alone (79%) followed by car (21%) which is a cause for concern. This finding is in accordance with other studies reported in the literature.^{1,3,5,6} The reason alluded for this include the increasing popularity of motor bike as an effective means of communication within the town. The relatively small size of motor-bike enables it to easily navigate through narrow roads/streets and traffic jams. More over commercial motorcycling is also increasing day by day due to high unemployment rate in the society.¹⁵ Another possible reason is low cost of a motor bike as compared to a car which makes it more affordable to the middle and lower middle class families. Where at times whole family utilize motor bike for traveling.

In this study, the predominant group of patients who were affected by motor bike accidents were

males with a male to female ratio of 3.2:1. The most vulnerable age group remained the third decade of life (45 %) followed by second decade (27.6%). This tendency of involving young age and male gender was similar to other studies done worldwide.^{3,7,14} At the same time it represents the life style choices and social behavior of individuals, in this society. As young men are more enthusiastic and usually actively participate in outdoor profession and activities as compare to women who spent most of their time at home.¹⁶ In addition, our cultural values allow more males to ride motorbike while the females tend to be pillion riders to their spouses. Furthermore, men started to drive from an early age and are more eager to show risky behavior on the roads like over speeding or stunt actions etc.¹

In relation to the use of security device like helmet, only a minority of the motorcyclists (12.5%) wore them during riding in the present study. This finding is in agreement with other studies.^{3,11} It has been proven in the literature that helmets significantly lowers injury severity and the possibility of death during crash.¹⁸ Helmets besides providing protection against cranial injuries, it minimizes maxillofacial trauma as well. Abosadegh MM et al³ showed in their study that those individuals who wore a helmet had significantly less number of nasal and orbital wall fractures as compare to those who did not use it.

The ongoing study revealed that among maxillofacial injuries, the mandibular fractures constituted the predominant group (46.7%) followed by zygomatic fractures (34%). The least common site involved was Naso Orbito Ethmoid (NOE) (0.7%). This corresponded positively to the results of other studies.^{7,19} The reason for predisposition of mandible to trauma is considered due to its prominent anatomical position and mobile nature.¹⁵ As most riders are without helmets, they experienced a direct fall on the chin during crash.^{19,20}

CONCLUSION

Majority of the patients were young males. Most of the injuries were related with individuals without helmets. The most frequent site of injury was mandible and the NOE injury was rare among the facial injuries.

RECOMMENDATIONS

Majority of the road traffic accidents in our

study were related to young age group and individuals without helmet. Government must strengthen the legislation and its implementation for wearing helmets and licensure for driving motorbikes. This will reduce burden on government hospitals and undoubtedly reduction in burden on national economy of this poor nation.

REFERENCES

1. Singaram M, Vijayabala S, Udhayakumar RK. Prevalence, pattern, etiology and management of maxillofacial trauma in a developing country: a retrospective study. *J Korean Assoc Oral Maxfac Surg* 2016;42:174-181.
2. Teshome A, Andualem G, Tsegie R, Seifu S. Two years' retrospective study of maxillofacial trauma at a tertiary center in North West Ethiopia. *BMC Res Notes*.2017;10:1-6.
3. Abosadeh MM, Saddki N, Al-tayar B, Rahman S. Epidemiology of maxillofacial fractures at a teaching hospital in Malaysia: a retrospective study. *Biomed research international*.2019;1:1-10.
4. Liang CC, Liu HT, Rau CS, Hsu SY, Hsieh HY, Hsieh CH. Motorcycle-related hospitalization of adolescents in a level I trauma center in southern Taiwan: a cross-sectional study. *BMC*
5. Adeleye AO, Ogun MI. clinical epidemiology of head injury from road traffic trauma in a developing country in the current era. *Frontiers in Neurology*. 2017;8:1-6.
6. Samieirad S, Tohidi E, Shahidi PA, Hashemipour MA, Abedini A. Retrospective study of maxillofacial fractures epidemiology and treatment plans in Southeast of Iran. *Med Oral Patol Oral Cir Bucal*.2015;20:e729-36.
7. Samieirad S, Aboutorabzade MR, Tohidi E, Shaban B, Khalife H, Hashemipour MA et al. Maxillofacial fracture epidemiology and treatment plans in the Northeast of Iran: a retrospective study. *Med Oral Patol Oral Cir Bucal*.2017;22(5):e616-24.
8. Achempong AO, Nartey MN, Yeboah SO, Mensah J, Amuasi A, Sabbah D et al. Motorcycle related oral and maxillofacial injuries seen at Komfo Anokye teaching hospital, Kumasi-Ghana. *Surg.science*.2019;10:106-12.
9. Liu HT, Liang CC, Rau CS, Hsu SY, Hsieh CH. Alcohol related hospitalizations of adult motorcycle riders. *World J of Emer Surg*.2015;10(2):1-8.
10. Hinds JD, Allen G, Morris CG. Trauma and motorcyclists; born to be wild, bound to be injured. *Injury Int J Care Injured*.2007;38:1131-8.
11. Ruslin M, Wolff J, Yusuf HY, Arifin MZ, Boffano P, Forouzanfar T. The influence of helmet on the prevention of maxillofacial fractures sustained during motorcycle accidents. *Cogent engineering* 2018;5:1-7.
12. Carter PM, Buckley L, Flannagan CA, Cicchino JB, Hemmila M, Bowman PJ et al. The impact of Michigan's partial repeal of the universal motorcycle helmet law on helmet use, fatalities and head injuries. *AM J public health*.2017;107(1):166-72.
13. Christian JM, Thomas RF, Scarbecz M. The incidence and pattern of maxillofacial injuries in helmeted versus non-helmeted motorcycle accident patients. *J Oral Maxfac Surg*.2014;72(12):2503-6.
14. Maliska MCS, Borba M, Asprino L, Moraes M, Moreira RWF. Oral and Maxillofacial surgery helmet and maxillofacial trauma: a 10 year retrospective study. *Braz J Oral Sci*.2012;11(2):125-9.
15. Oginni FO, Oladejo T, Alake DP, Oguntoba JO, Adebayo. Facial bone fractures in Ile-Ife, Nigeria: an update on pattern of presentation and care. *J Maxfac.Oral Surg*.2016;15(2):184-90.
16. Almeida GCM, Medeiros FCD, Pinto LO, Moura JMBO, Lima KC. Prevalence and factors associated with traffic accidents involving motorcycle taxis. *Rev Bras Enferm [Internet]*. 2016;69(2):359-65.
17. Rahman NH, Rainis R, Noor SH, Mohamad SMS. The buffering analysis to identify common geographical factors within the vicinity of severe injury related to motor vehicle crash in Malaysia. *World J Emerg Med*.2016;7(4):278-84.
18. Maliska MCS, Borba M, Asprino L, Moraes M, Moreira RWF. Helmet and maxillofacial trauma: a 10-year retrospective study. *Braz J Oral Sci*. 2012;11(2):125-9.
19. Gaddipati R, Ramiseti S, Vura N, Reddy R, Nalamolu B. Analysis of 1545 fractures of facial region- a retrospective study. *Cranio maxfac trauma and recon*.2015;8(4):307-14.
20. Agbor AM, Azodo CC, Ebot EB, Naidoo S. Dentofacial injuries in commercial motorcycle accidents in Cameroon: pattern and cost implication of care. *African Health Sci*.2014;14(1):77-82.