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ORIGINAL ARTICLE

Assessment of Mandibular Trauma Sustained in Motorcycle Accidents at Liaquat University Hospital Hyderabad

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ABSTRACT

Background: Motorcycle accidents regularly impact the maxillofacial structures, with the mandible being one of the most usually shattered bones. Helmets have been found to have a preventive effect in avoiding maxillofacial injuries, although their impact on the likelihood of mandibular fractures is unknown.

Objective: To assess the pattern of mandibular trauma among the motorcycle accidents reported at Liaquat university hospital Hyderabad.

Subject and Methods: A total of 150 patients having mandibular fracture were selected. Patient's data including age, gender, use or no use of a protective helmet at the time of trauma, type and site of fracture, speed limit and collision pattern weren recorded on a prescribed design Performa. Diagnosis of the trauma was carried out on the basis of clinical and radiographic evaluation (PA view of face, Orthopantomogram).

Results: Males were predominantly affected as compared to females. Mean age in male was 29.5 and in females 33. 96 subjects were not using helmets during trauma. Most of the patients were having compound fracture. Collision with car was mostly seen as etiology. Parasymhysis with condyle was most common site involved followed by isolated parasymphysis and symphysis.

Conclusion: To reduce the amount of face injuries in such incidents, educational programmes, defensive driving, and the usage of appropriate helmets are required.

Keywords: Mandibular trauma, Motorcycle Accident, Helmet, Compound Fracture

INTRODUCTION

Maxillofacial injuries can have critical longstanding emotional, esthetic and socio-economic impact on an individual. Maxillofacial trauma may present differently in numerous nations indeed within the same country. Motorcycle accidents are common all around the world, but they are more widespread in underdeveloped countries.[1] In Pakistan casualty related to road traffic accident is the driving cause of mortality.[2]

Among the most common forms of body injuries are maxillofacial injuries. There are 3 divisions, particularly, facial bone fractures, soft tissue accidents, and dentoalveolar accidents. Etiological factors are classified as motor automobile injuries, assaults, falls, and sporting injuries.[3] Among these factors, motorcycle related injuries were found to be the commonest cause of maxillofacial fractures in the city of Hyderabad, Pakistan.[4] Motorcycle traffic accidents result in significant maxillofacial injuries, which are a genuine community health concern.[5]

The most frequent maxillofacial accidents are fractures of the mandible and bones of the middle 1/3 of the face. Because it is one of the most prominent regions of the human body, the maxillofacial region is susceptible to a variety of traumas.[6] As a result, motorcycle accidents regularly harm the maxillofacial structures, with the mandible being one of the most usually shattered bones.[7]

Motorcycle accidents are an epidemic in today's developing world nations, and they have become a public health worry due to the high incidence of illness and fatality they produce.[8] Motorcycles are the most risky mode of motorised transportation; motorcycle riders are 3 times more prone to be wounded in an accident than passenger car riders, and 16 times more likely to die every vehicle mile driven. Investigations of Motor Vehicle Accidents -related maxillofacial injuries are critical to clarify the mechanisms and socioeconomic prices of motor vehicle accident injuries, particularly because patients with oral and maxillofacial accidents frequently accumulate disabilities and require lengthy-term treatment.[9,10]

Helmets have been found to provide protection against craniofacial injuries.[11] Preventing maxillofacial accidents is a valuable pursuit for improving the fine of existence of the involved subjects and lowering the socioeconomic costs of motor automobile collision accidents.[9,12]

Irrespective of the developing frequency of morbidity and mortality associated with maxillofacial fracture among the motorcyclist in Pakistan, little has been published in this study. This is mainly vital because of the truth that Pakistan represents a vast different ethnicity, cultural, environmental and educational backgrounds. This research aims to evaluate the distribution of mandibular fractures among motorcycle collision victims at a renowned tertiary care hospital in Hyderabad, because motorcycle injuries account for a significant proportion of hospital admittance and fatalities in the city.

MATERIAL AND METHODS

This descriptive Case Series with Non probability purposive technique was carried out at Department of Oral & Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro/Hyderabad from March 2019 to December 2019.

The sample size was calculated by Raosoft online calculator with margin of error as 5% and confidence interval as 95%. Total sample size calculated was 150

Inclusion Criteria:

- Patient having fracture mandible with a history of Motor Vehicle Accident.
- Patient above the age of 18 years.
- Irrespective of gender.

Exclusion Criteria:

- Medically compromised patient.
- Patient not willing to participate in the study.
- Patients with any co-morbid.
- Any other skeletal injury.
- Old / Mal union / Nonunion fractures.

Data Collection Procedure: After approval of study from institutional ethical review committee, the data was collected. Patients who came to the indoor/outdoor department of Oral & Maxillofacial Surgery and ER were clinically examined and those

meeting the inclusion criteria were selected for this study. Fully informed written consent of the patients was taken. A structured Performa was used to record findings of this study along with patient's demographic data like patient's age and gender

Patient's data including age, gender, use or no use of a protective helmet at the time of trauma, type and site of mandibular fracture, mode of collision and speed limit were recorded. Diagnosis of the trauma was carried out on the basis of clinical and radiographic evaluation (PA view of face, Orthopantomogram).

RESULTS

A total 150 patients (106 Males, 44 Females) were included (Table 1) with mean age range of 29.5 in males and 33 in females. Findings of gender and age are mentioned in table 1.

Most of the patients does not wear helmet i.e 126 have not worn helmets and 25 were wearing helmet at the time of trauma. Majority of patients encountered RTA were having compound type of fracture, followed by simple and comminuted fracture. In terms of etiology most patients had collision with car (46%), followed by collision with biker (36%). All these findings are tabulated in table 2.

Most numbers of patients were having the speed limit more than 60km/hr with P value of 0.032, as shown in table 3. The details of site of fracture involving mandible is shown in table 4.

Tabele 1: Distribution Statistics Of Gender And Age

GENDER	NO OF PATIENTS	PERCENTAGE	MEAN AGE	STANDARD DEVIATION
MALE	127	84.66%	29.5	8.94
FEMALE	23	15.33%	33	11.28

Table 2: Findings Related To Motorcycle Accident

Helmet worn		
Yes	54	36%
No	96	64%
Rta mode		
Motorcyclist himself	106	70.66%
Accompanying passenger	44	29.33%
Type of fracture		
Simple	50	33.33%
Compound	72	48%
Communited	28	18.66%
Etiology		
Collision with biker	54	36%
Collision with car	09	6%
Collision with bus	69	46%
Collision with pedestarian	06	4%
Collision with crane	11	7.33%
Collision with animal	01	0.66%

Table 8: Motor Vehicle Speed Limit Of Subjects (n= 150)

SPEED LIMIT	NO OF PATIENTS	%AGE	P VALUE
< 20 KM/H	05	3.33%	0.013
< 40 KM/H	44	29.33%	0.045
< 60 KM/H	101	67.33%	0.132
TOTAL	150	100%	

Table 10: Site Of Mandibular Fractures (n= 150)

Site Of Fracture	No. of Fracture	Percentage	P Value
1. Condylar	19	12.66%	0.127
2. Coronoid	02	1.33%	0.023
3. Angle	19	12.66%	0.273
4. Body	16	10.66%	0.101
5. Ramus	04	2.66%	0.078
6. Symphysis	20	13.33%	0.127
7. Parasymphisis	24	16%	0.212
8. Dentoalveolar fractures	12	8%	0.098
9. Parasymphysis with Condyle	34	22.66%	0.226

DISCUSSION

The issue of road traffic crashes has been regarded as a "growing epidemic" in Pakistan, a middle-income country. Between 1956 and 1996, there was a 16-fold rise in the number of deadly motor vehicle accidents and a 14-fold rise in the total number of motor vehicle wrecks over a 40-year period.[13,14]

By 2020, traffic deaths are expected to be the third most common cause of death in emerging nations, with motorbikes accounting for a major share of these deaths. Motorcycles are particularly dangerous vehicles. Motorcycle riders are at an increased risk of accident because the small size of the motorcycle makes them more prone than automobile drivers to experience serious injuries.[15] High-energy trauma caused by motorcyclists is responsible for higher percentages of soft tissue lacerations and facial fractures. Motorcycle collisions accounted for about a third of all maxillofacial injuries treated in this field of oral and maxillofacial surgery, resulting in significant fatality.[16]

According to the outcomes of this research, motorcycle collisions were more likely in males than in women, which is consistent with reports from throughout the world.[17-19] Men are more likely than women to be involved in crashes and suffer maxillofacial injuries as a result of the increased use of motorcycles as a mode of transportation because they work in passenger mass transit.[20] According to Oginni et al, the male-female ratio in motorcycle crashes was 3.5:1, with men having a peak age occurrence of 20 to 29 years and females having a peak age rate of 10 to 19 years.[21] In accordance with the present study, other Brazilians studies investigated the prevalence of young males involved in two-wheel vehicle accidents.[8]

Mandibular fracture impacted participants of all ages in this research, although those aged 25 and above were the most harmed, as this age group consisted of youngsters who are more prone to exercise in the course of their everyday routines. Chichom-Mefire et al[22] in a Cameroonian study reported that the majority of their patients (57.6%) were aged 21 - 40 years. Ogini et al[21] in Nigeria and Ramli R[23] in Malaysia reported an average age of 25.8 and 30.6 years. The high prevalence of young male adults (mean age 29.5 years) in motorcycle accidents in this study backs with earlier findings.[6,24,25]

The single most efficient strategy for reducing head injuries among motorcyclists is to wear a helmet.[26] In this study 64% of the patients did not wear a helmet at the time of the accident. In contrast an earlier study carried out by Khan I[13] in Karachi in 2008 showed 56% patients were using helmet at the time of injury. The rate of helmet use varies from one country to another. In Iran, it increased from 8.6% to 75% (1999-2007).[27] In a research conducted in Pamplona, Spain, 19.7% of motorcycle drivers were found to be wearing helmets, which climbed to 94.8 % after the implementation of a municipal helmet ordinance.[28] The lower fraction of passengers wearing helmets in this survey might be accounted by passengers' lack of understanding that they are required to do so.[29]

In this study mandibular parasymphysis and symphysis were the most common sites reported with motorcycle crashes. Because the middle regions of the body are more vulnerable than the sides in head-on collisions, the parasymphysis and symphysis may be susceptible to fracture during motorbike wrecks. Similar results were reported by Moshy JR[5] in his study. Fracture of the parasymphysis combined with condyle was also reported in majority. The theory that the mandible may be considered as a single bone spanning both sides could explain this phenomenon. As a result, direct fractures on the striking side were frequently accompanied by indirect fractures on the contrary side. [30]

The outcomes of our research have strategic and law enforcement consequences. Further research is required to confirm our findings in a broader sample size as well as by direct observation of rider behavior.

CONCLUSION

This study concluded that young males were more prone to sustain fracture mandible from motorcycle accidents. Helmets are worn by motorcycle drivers in Pakistan far less frequently than they should be. To reduce the amount of face injuries in such incidents, educational programmes, defensive driving, and the usage of appropriate helmets are required. Our findings imply that public education and awareness messaging on the dangers of head injuries may encourage motorcyclists to wear helmets.

Recommendations: It is necessary to enforce and maintain rules and regulations governing the use of protective gear by motorcycle riders. There should be a platform for continuous education for motorcyclists on risk factors linked with motorcycle collisions, and motorcyclists should be bound by current norms and regulations to reduce road traffic crashes.

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