PATTERNS AND SEVERITY OF MAXILLOFACIAL INJURIES IN VICTIMS OF MOTORBIKE ACCIDENTS AND THEIR RELATIONSHIP TO ALCOHOL CONSUMPTION

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ABSTRACT Introduction: Trauma is a leading cause of morbidity and mortality worldwide. Motorbike riders have the highest incidence of road traffic accidents. The maxillofacial region is highly vulnerable to such incidents. Injuries to this region can lead to severe bleeding and airway compromise. Not wearing a helmet and drug intoxication can increase the risk of accidents and their complications. Patterns and severity of these injuries vary with road conditions, speed and type of impact. **Aims and Objectives:** The current study intends to assess the patterns and severity of maxillofacial injuries among intoxicated and non-intoxicated victims of motorbike accidents. **Materials and Methods:** The present study was a single-centre, Prospective Observational study conducted on patients admitted into the emergency medicine department with suspected maxillofacial injuries to motorbike accidents at PESIMSR Hospital, Kuppam, from October 2018 to July 2020. **Results:** There was a clear male preponderance with 11 males for every female. Two-thirds of patients were aged between 25 and 50 years. Skid and fall and head-on-collision were common mechanisms of injury. Soft-tissue injuries like abrasions and lacerations were common injuries. Ninety-one patients had facial fractures, mostly involving the midface. Nasal bone fractures were most frequent. Of the 149 patients, 54 had an A.I.S. score of 1, 43 had 2, 21 had 3, 18 had 4 and 13 had 5. There was no significant difference in the severity or patterns of injuries in intoxicated patients. **Conclusion:** Midface injuries are more common. Intoxication increases the risk of injuries. But it does not seem to alter the patterns and severity of injuries.

KEYWORDS maxillofacial injuries, patterns and severity, motorbike accidents, the influence of alcohol

Introduction

Trauma is a significant cause of morbidity and mortality worldwide. Two-wheeler riders have the highest road traffic accidents due to their unrestrained nature. Risk is compounded by alcohol consumption in this group through reduction of judgmental capacity. Also, alcohol leads to risk-taking behaviour, impaired judgment and involvement in dangerous and adventurous activities. This type of behaviour leads to an increased rate of severity and mortality. Chest, head, neck, maxillofacial and abdominal injuries are common in two-wheeler accidents[1].

Maxillofacial trauma can be trivial and cause only cosmetic disfigurement. However, it can also lead to death due to airway compromise. Maxillofacial injuries will not occur alone and may be associated with head, neck and long bones injuries. Maxillofacial injuries happen in many trauma patients requiring prompt diagnosis and management. Maxillofacial trauma is a joint presentation in Accident and Emergency departments of hospitals either as an isolated injury or as part of multiple injuries to the

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head, neck, chest, and abdomen. These injuries may cause severe physical, physical, and cosmetic disabilities. The aetiology of maxillofacial trauma varies from one geographical region to another. Depending on the prevailing socio-economic, cultural, and environmental factors, it can also differ within the same area. The injury severity may vary from superficial soft tissue lacerations to more complicated fractures of the maxillofacial skeleton[2].

Aims and Objectives

The current study intends to assess the patterns and severity of maxillofacial injuries among intoxicated and non-intoxicated victims of motorbike accidents.

Materials and Methods

The present study was a single-centre, Prospective Observational study conducted on patients admitted into the emergency medicine department with suspected maxillofacial injuries to motorbike accidents at PESIMSR Hospital, Kuppam, from October 2018 to July 2020.

Inclusion criteria

- All patients suspected to have facial trauma after a motorbike accident

Exclusion criteria

- Extremes of Age
- Patients not willing the study

Study design

- TOOLS TO BE USED

Abbreviated Injury Scale (AIS)

AIS Code	Description
1	Minor
2	Moderate
3	Serious (non-life-threatening)
4	Severe(life-threatening)
5	Critical
6	Unsalvageable

- X-ray maxilla
- CT facial bones

Method of Collection of Data

- All cases presented to the emergency medicine department with motorbike accidents will be evaluated per standard protocols. According to the A.I.S. score, patients with facial injuries will be scored for severity.
- Details regarding alcohol consumption will be collected for analysis.

Statistical analysis

Data were analyzed using IBM SPSS Statistic for Windows. Data will be presented as descriptive, and a t-test will be used to check statistical significance.

Results

One hundred forty-nine patients satisfying the inclusion criteria were enrolled for the study. There were 137 males and 12 females.

People aged between 25 and 50 accounted for 76.50%, followed by those aged less than 25 (16.8%). Skid and fall were the most common mechanism of injury, followed by a head-on collision with another object or vehicle. In addition, 83 (55.7%) had consumed alcohol before the incident, and 66 (44.3%) did not. 135(90%) patients did not wear a helmet at the incident. The most common facial injuries were abrasions and lacerations.

91(67.4%) patients had facial fractures. Fractures of the midface were most frequent (58), followed by multiple facial bone fractures (13), upper face (11), and lower face (8), in that order.

At the time of admission to the hospital, 120(80.6%) patients had a patent airway, 16 (10.7%) patients had maintainable airway, and 13 (8.7%) patients had a compromised airway needing intubation and mechanical ventilation. The most common reason for intubation was airway compromise due to reduced G.C.S. and bleeding from the facial injury. Head injury (67) and long bone fractures (78) were the most common associated injuries. A minority of patients had chest and abdominal trauma.

33.6% of patients had a loss of consciousness or altered sensorium on presentation to the hospital. Of the 149 patients, 54 had an A.I.S. score of 1, 43 had a score of 2, 21 had a score of 3, 18 had a 4 and 13 had a 5. None of the patients presenting to the E.D. had unsalvageable facial injuries. Patients who did not consume alcohol had a mean A.I.S. score of 2.05±1.156. Patients who drank alcohol had an A.I.S. score of 2.469±1.39106. The P-value is 0.8230, which is not significant.

Discussion

A road traffic accident is a significant public health problem. It results in death and disability among the survivors, who can be a burden to society.[1] India, being a developing country is undergoing a demographic, epidemiological, and economic transition that has changed the health scenario significantly.

The effectiveness of various preventive and educational programs concerning maxillofacial trauma may be reflected through a continuing audit of the pattern of such trauma in different parts of the world. Considerable variation has been reported in the profile of facial injuries concerning geographical location, socio-economic status, and cultural background.

The observations and results of the present study were compared with the available previous similar studies. There was a clear male preponderance in the present study with a male to female ratio of 11.41: 1. In the study done by Karpal S Sohal[3], there was a vast male preponderance with a male: female ratio of 37.7:1. Other studies by Abul Hasnat (2017) and Satish Kumar G. Patil (2018) showed a similar male preponderance with a male to female ratio of 7.5: 1 and 10.1: 1, respectively. The seeming differences can be attributed to the males and females ratio in the particular community and socio-cultural habits. In most rural societies, females are confined to the home and undertake travels less frequently. Even if females travel on motorcycles, they will be pillion-riders rather than riders.

.the study by Abul Hasnat et al.[4]; found that most patients were in the age group 20 to 40 years. The mean age was 29.63 years, which is similar to other studies. The possible explanation is that the people in this age group participate in dangerous sports and drive motor vehicles carelessly. Patients less than ten

years and more than 60 years were less frequently affected in the current study. This could explain that elders usually take care of children while travelling and less mobility of seniors.

Similar observations were made by Mishra B et al.,[6] Bener A,[7] Jirojwong S,[8] WHO in the Injury Chart book[9], Rakhi Dandona et al.,[10] Khare N et al.,[11] Agarwal et al.,[12]. Similar findings were also observed in Delhi,[13] and Pondicherry studies.[14] This can be attributed to the fact that this age group is more active and often travels for the job and recreational activities. They also tend to use less protective gear and involve in dangerous adventures. In addition, more young people have less access to two-wheelers.

In the present study, about 42.3% of collisions are self-skid. Fall, followed by 39.6% head-on collisions, rear-end collisions were 8.1%, and hit by four-wheeler was observed in 4.7%, and trauma of unknown mechanism in 4% of the cases. On the other hand, the study BY Khare et al.[11] shows that 41.9% of R.T.A.s were due to skid & fall, 15.2% head-on collisions and 6% sideway collisions. On the other hand, Suhas babu[15] et al. found that a sideways collision of 46.7% is the prime mechanism, followed by a head-on collision of 27.5%.

Victims were hit from behind16.9 % of the time, and 8.9% gave a history of self-fall.

These studies' differences can be explained based on the roads' socio-economic conditions, type, and status. When the road surface is improper, the chances of self falls increase. The same can occur when obtuse turnings with poor visibility are present. Alcoholics or intoxicated riders can lose balance very quickly. This explains the higher rates of self falls in the current study. Side-on collisions usually occur when vehicles travel at higher speeds, especially near highway junctions.

Head-on-collisions occur on narrower roads without road dividers where traffic is bidirectional. Rural roads are usually narrower, and bidirectional traffic explains the disproportionately higher percentage of head-on-collisions in the current study.

Among 149 patients, 83 (55.7%) were under alcohol, and 66 (44.3%) had not consumed alcohol. The ratio between the alcoholic and non-alcoholic is 1.25:1. The current study has a higher proportion of accident victims who have consumed alcohol before riding. The survey conducted by Bharadwaj et al. shows that 18.01% of victims had a history of alcohol consumption within 6 hours before the accident. In the WHO-supported study in Nepal[16] (16.9%) of victims consumed alcohol 2 to 3 hours before the accident. Sreedharan J (2010)[17] had found that 20 % of the motorcycle riders had consumed alcohol. The availability of alcohol stores in highway junctions may be why a higher percentage of alcoholic riders in this study.

In the present study, 33.6% of patients had a loss of consciousness (L.O.C.), and 66.4% didn't have L.O.C. The ratio between Consciousness and L.O.C. is 1:1.98. Most patients presented with a history of L.O.C. Impaired consciousness due to alcohol intoxication and head injury following the accident. The study conducted by Pati SS[18] et al. showed that L.O.C. was 38%. The survey conducted by Deepak Sharma et al.[19] showed that L.O.C. was 35%. Loss of consciousness in trauma patients is reported to increase the risk of serious complications.

Patients with a history of L.O.C. traumatic brain injury should be ruled out first. The Glasgow Coma Scale (G.C.S.) was created to assess a coma's depth from traumatic unconsciousness causes.

In our study, 59.7% of patients had a G.C.S between 13-and 15, 28.2% of patients between 8-and 13, and 12.1% of patients had a G.C.S below 8. A similar observation was found in other studies like Godavarthi et al.[20]. B Agrawal et al.[21]. G.C.S. score is a good indicator of outcome in many other studies, including a local survey by Selladurai BM et al.[22]. which showed that over 95% of patients with a score of 4 or less are likely to have a poor outcome compared with those with a score of 8 or a more.

In the present study, among 149 patients,10.1% of patients had lacerations. Other studies like Singh SP et al., Shakeer Kahn P et al. and Niazi et al. observed a high cuts rate.

In this study, among 149 patients, 40.3% of patients had abrasions. Similar percentages were observed by Shakeer Kahn P et al. and Niazi et al. In this study, facial contusions and abrasions were the most frequent types of soft tissue injuries, followed by lacerations. Previous studies on maxillofacial injuries have reported contusions and abrasions as regular occurrences. In contrast, lacerations have been reported more frequently in severe trauma episodes resulting from traffic accidents.

. Fractures of the midface were most frequent (58), followed by multiple facial bone fractures (13), upper face (11), and lower face (8), in that order. Kapoor P et al. [2] study found that soft tissue trauma was the most common type of maxillofacial injury. Among patients with maxillofacial skeletal fractures, the mandible was the most frequently fractured bone (63.0%), followed by the midface (22.0%), while the remaining 15.0% cases demonstrated pan-facial fractures. Kai lee et al. study found that nasal bone (29.14 %) was most often the fracture site, followed by the mandible (28.0 %). Sharma M et al. study. Nasal fractures were found in 39.32%, followed by Zygomatic fractures in 23.59% and Maxillary fractures in 20%.

Mandibular fractures were the least common (16.85).

Most studies have found that nasal bones were most commonly fractured, followed by the maxilla and mandible. Nasal bones, most prominent on the face, will be easily cracked even with a trivial force like a direct blow or falling face down. As far as other bones are concerned, considerable power is required to cause a fracture.

At the time of admission to the hospital, 80.6% of patients had a patent airway, 10.7% of patients' airways were maintainable, and 8.7% had a compromised airway. Saudi J Anaesth[20]. 2011 et al. observed that in patients with maxillofacial injuries, airway secured by nasal intubation with direct visualization of vocal cords was most common in 57% of patients, followed by oral intubation in 17% of patients.

Maxillofacial trauma has its importance as it involves both vital and nonvital organs. It looks ghastly, may lead to massive haemorrhage, and is potentially life-threatening. The priority in these patients is airway maintenance with cervical spine control and management based on the Advanced Trauma Life Support (ATLS) concept for patients who sustained life-threatening injuries.

In this study, the riders under alcohol influence were more than non-intoxicated riders. The riders with more severe injuries were those under alcohol intoxication. Hence it is clearly understood that patients under the influence of alcohol were high-risk drivers. Furthermore, most R.T.A s happen under the influence of alcohol, and the severity of injuries as per A.I.S score was also higher in patients under alcohol. However, comparative data is lacking either to support or reject the findings.

Conclusion

Half of the road traffic accidents happen when the riders are under alcohol intoxication. Alcohol and driving should never be mixed. Alcohol increases the frequency of road traffic accidents. Alcohol does not seem to alter the pattern or severity.

Table 1 Distribution of fractures

Fractured region	No. of patients	Percentage
No fractures	58	38.9
Lower face	8	5.4
Midface	59	39.8
Upper face	11	7.4
Multiple facial fractures	13	8.7

Table 2 ALCOHOL and its association with AIS SCORE among the subjects.

AIS SCORE	ALCOHOL		X^2 value	'p' value
	Yes	No		
1	28(51.85%)	26(48.15%)	6.3334	0.176
2	20 (46.51%)	23 (53.48%)		
3	12 (57.47%)	9 (42.85%)		
4	14 (77.77%)	4 (33.34%)		
5	9 (69.23%)	4 (30.76%)		
Total	**66**	**83**		

Injuries to the midface region, especially those of nasal bones, are more frequent, which may cause airway compromise. Therefore, the emergency physician should look for airway compromise carefully and manage accordingly. Although alcohol does not directly alter the pattern or severity, it can increase complications.

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Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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