

PATTERNS AND SEVERITY OF INJURIES IN MOTORBIKE ACCIDENTS IN A RURAL AREA

Clinical Research

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ABSTRACT

Introduction - Two wheeler accidents account for 25% of all accidents. EMS teams can triage the patients to the nearest appropriate centre. ED physician can involve other departments early to preserve life and reduce morbidity. This study was aimed at determining patterns of injuries and their severity based on injury Severity Score(ISS) in patients with trauma-related to motorbike accidents. **Methods**- This is a retrospective, observational study. **Results**- Younger males appear to have involved in motorbike crash frequently. External injuries are most common, followed by extremity injuries. Lower limbs, especially fractures of tibia and fibula are commonest extremity injury. Cerebral contusions and subarachnoid haemorrhage are the common injuries of head and neck. Fractures of zygoma and maxilla are dominant facial fractures.

Conclusion- Most cases have low ISS. Drunken driving appears to be the most frequent cause serious injuries. Improving road conditions and controlling traffic can have positive on reducing the accidents.

KEYWORDS

INTRODUCTION-

Motor vehicle accidents are increasing worldwide. According to a survey conducted by WHO in 2018, 13.5 lakh die each year worldwide¹. India alone accounts for 1.5 lakh deaths every year. One person is dying every minute in India due to a road traffic accident. Two-wheeler accidents account for 25% of all road traffic accidents. Twenty children and 377 adults lose life everyday attributable to road traffic accidents². As economic status improves, more and more people are opting for motorised vehicles as an easy means of transport. Motorbike accidents usually occur in younger males who ride carelessly. Lack of protective gear and over speeding are implicated, leading to dire consequences.

Data is available for major cities, whereas it is scarce in rural India, mainly due to under-reporting. Young motor cycle riders appear to have more serious injuries and frequent injury is head and neck region. Accidents in younger age group is due to reckless driving and overspeeding. In older riders the crashes are mainly due to hitting other objects on the roads. They had more serious injuries to the thoracic region. Pre-existing medical illnesses also contribute to collisions and accidental falls while riding.

Need for the study - Knowing the patterns of injuries and their severity can help to make early Prehospital and ED decision. EMS teams can triage the patients to the nearest appropriate centre. ED physician can involve other departments early to preserve life and reduce morbidity. Aim of the study - This study was aimed at determining patterns of injuries and their severity based on injury severity index in patients with trauma-related to motorbike accidents.

Methods - The current study was a retrospective, observational study. The sample size was 500. Hospital records were verified for finding patients presenting after a motorbike accident. Their demographic profile was recorded. ISS score was calculated based on the most severe injury in each of the six body regions using online calculators.

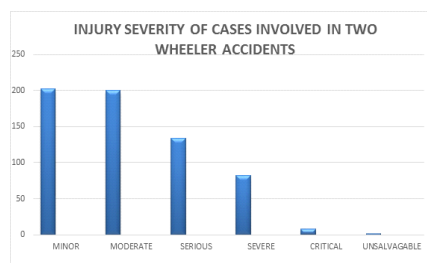
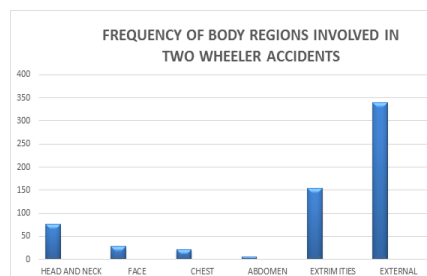
Descriptive epidemics were used for non-discrete variables, and discrete variables were presented as mean and standard deviation.

RESULTS

Of the total 500 cases, 428 (85.6%) were males, while the rest (14.4%) were females. The average age was 33.3, with a standard deviation of 14.29. People aged less than 45 years constituted 83.8% of the total involved in motorbike crashes. 67% of these accidents are due to self skid and fall. Rest are due to collisions with other vehicles mostly

head-on collision. The current study didn't show any statistical significance in mechanisms of fall between young and the old. In less than 45 years age group, commonest mechanism of injury was skid and fall (66.8%) followed by collision with other vehicles (32.4%) and mechanism not known in a negligible number of cases. 80% of patients who had a skid and reported stray dogs as the main reason for losing balance. One hundred ten patients had consumed alcohol before riding.

Most commonly involved regions of the body injured were external in 340 cases followed by extremity (154), head and neck (78), face (28), chest (22), abdomen (6) in that order. The most common type of injury in the external region was the laceration, followed by abrasions and contusions in decreasing frequency. The closed long bone fracture was the major extremity injury by followed by open fractures. Fractures involving tibia and fibula were the most common lower limb injuries (40 patients). Ninety-eight patient had their lower limbs injured, while 56 had injuries over the upper limbs. This has t-score of -8.757605 with 100% significance. Cerebral contusions and subarachnoid haemorrhage have an equal frequency occurring in 18 cases each, followed by Extradural haemorrhage in 12 cases and Subdural hematoma in 10 cases. Head injuries were most frequent in those consuming alcohol and injuries were more severe in them.



Maxillofacial fractures form a majority of injuries in the facial injuries followed by intraoral injuries in negligible proportion. Nine patients had zygomatic arch fractures, another same number of patients had maxillary fractures. Nasal bone fractures were noted in 6 patients. Of the 22 patients sustained chest injury, 18 had clavicle fracture, 2 had flail chest, and 2 had hemothorax. The abdomen was the least commonly affected region in motorbike accidents with liver, spleen and lumbar spine injuries. Most patients fall in minor(202) and moderate(200) injury levels of the Abbreviated Injury Scale(AIS). Those having minor and moderate had mostly simple external injuries. Only two patients had unsalvageable injuries. Injury severity score ranged from 1 to 75, with a mean score of 7.74 and a standard deviation of 7.79.

Discussion

WHO reported about 1.5 million deaths attributable to road traffic injuries. The current study has 33.6 years as average age^{1,4}. The WHO survey reported age ranging from 5 years to 29 years as the most common age group vulnerable to accidents. Another study reported 26-40 year age band as a most vulnerable group in rural areas which is reflected in the current study. There is a clear male predilection in this region. This might be the fact that, in rural India, males move from one place to another and ride bikes more frequently, making them vulnerable. A study published in the journal of Pakistan orthopaedic association has shown a similar male predilection (79.4:20.6). Previous studies have reported a propensity for younger people to have skid and fall, while older adults had collision³. No such difference could be made in the current study. Losing balance and crashing, especially under the influence of alcohol, was the most common cause of an accident in this study. Earlier reports quote multiple causes including alcohol, sudden lane changes, inexperienced rider, bad weather, debris on the road, bad road conditions⁶.

External injuries like abrasions and lacerations were the most frequent in this study. This correlates well with multiple earlier studies which quote lacerations were most frequent. Lower limb injuries were more frequent than upper limb injuries⁷. Most common lower limb injury was fracture involving tibia and fibula. Various previous studies have returned similar results⁷. The cause for lower limb injury predilection might be entrapment under the vehicle, first impact to lower limbs and the fact that upper limbs are the handles and supported, but lower limbs are not supported. Among patients having a head injury, cerebral contusions and subarachnoid haemorrhage were common. A study from India has shown that skull fractures are the most frequent injuries, followed by subdural haemorrhage during an autopsy. There is a difference in observations from the current study. This difference might be because of skull fractures especially depressed and open skull fractures are very serious and the patients never reach the hospital alive. The same study also stated that rib injuries were commonly associated with head injuries. However, no such correlation was found in the current study. Multi-system injuries being more serious, patients may not reach the hospital, especially so in resource-limited rural areas⁸.

Chest involvement was less common in the current study involving only 22 cases. Of the 22 cases, 80% were clavicle fractures. Severe life-threatening injuries formed the rest. An earlier study examining fatal road traffic accidents has noted chest injury as the second frequent cause of death (32.1%). Even this study states head injury as the most common fatal injury and associated limb injuries in most patients. The abdomen was the least injured region in the present study, a fact that is endorsed in all the previous studies. Liver and spleen injuries are frequently diagnosed abdominal injuries. But one has to keep in mind that intestinal and mesenteric injuries frequently go undiagnosed^{9,10}. ISS was calculated based on the most severe injuries in each of the six body regions involved using an online calculator. The mean ISS was 7.74 with a standard deviation of 7.79. This reflects that the majority of patients had only minor injuries. Most frequent ISS score was 5. An ISS score of 1 was present in 124 cases.

Conclusion

Motorbike accidents mostly involve young male riders. Most patients will have only minor external injuries. Serious injuries occur in those with a collision with other vehicles and those under the influence of drugs and alcohol. Educating the general public about traffic rules, imposing strict rules, avoidance of overspeeding and drunken drive, improving road conditions and regulating traffic can have a positive impact on reducing the two-wheeler accidents.

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