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Motorcycle Accident Profile in Manipal Teaching Hospital

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Abstract This is a prospective descriptive study conducted at Manipal Teaching Hospital (MTH), where 140 patients seen at Emergency Room and OPD with a history of motorcycle accident from May 2015 to August 2015 were studied. Results showed that a high percentage of males 121 (86.4%) were involved in motorcycle accidents. Peak age range was 31-40 years old (61) (43.5%). Most of the motorcycles were manufactured in India (118) (84.2%). Single rider type of motorcycle accounted for 32(22.8%) of cases with a average speed of 50-70 km/hr (76.4%). The driver of the motorcycle was significantly involved in 106(75.7%) of cases. Alcohol intake was found in 40(28.6%) and non-license holder was 22 (15.7%) among accident victims. Abrasions 92(65.7%) was the predominant injury sustained followed by fractures 28(20%), lacerations 15(10.7%), and hematoma 10 (7.1%) in isolation or in combination. Combination of pain relievers128(91.4%), antibiotics 95(67.8%), suturing 18(12.8%), antitetanus 107(76.4%) and fracture management 21(15%) were the mode of management for these accidents. Most patients seen were discharged 116(82.8%) with home medications, wound care and follow-up, and only 24(17.2%) were admitted for observation and specific medical and surgical management.

Keywords: *motorcycle, accidents, manipal teaching hospital*

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1. Introduction

A recent and serious trend in the country is the drastic rise of motorcycle ownership and use. During these times of rising oil prices and worsening traffic problems, many of our countrymen are now using motorcycles as their primary means of transport. These vehicles are easier to maneuver during heavy traffic are more fuel-efficient and economical than cars.

While the road accident situation is slowly improving in the high-income industrialized countries, most developing and underdeveloped countries as Nepal face a worsening situation. Urbanization and motorization in the developing countries has led to an increase in traffic congestion in urban centers and increased the traffic accidents.

Most of the motorcycle drivers have poor safety awareness resulting in violation of the traffic regulations. Many vehicles are old, not maintained and is thus not appropriate to be used in the roads. Added to these, is ignorance of traffic rules. Key preventive measures include the limitation on speed and alcohol intake, and improving vehicle standards and safe road design and conditions. In many Asian countries these essential measures are lacking. It is the objective of this study to describe the profile of motorcycle accidents seen at MTH and to find out & suggest to authority if any improvement can decrease the rate of accident in out part and in Nepal.

Recent statistical data gathered from Department of Land Transportation Office revealed that among registered motor vehicles, motorcycles were about 36.17% in the year 2005. This figure has dramatically increased in the year 2014 to about 45.19%. Accompanied by this rise in the number of motorcycles was also the concomitant rise in motorcycle accident figures [1].

Motorcycle lanes will be required to designate or construct on major roads and highways to enhance the safety of motorcyclist. This scheme is meant to address the growing number of motorcycles traversing major roads and bridges and to ensure the protection of all motorists and the increasing prevalence of road accidents involving this type of motor vehicle.

Records at the Land and Transportation Office Show that in May-August 2015 alone, a total of 5163 new motorcycles were registered comprising almost 37.9% of the 13612 motorcycles registered in the past year. Data from the Traffic Police of Pokhara, Prithivichowk revealed that of the 6523 traffic accidents that were reported from all over the country in 2012, upto 21 percent involved motorcycles. In 2013 a total of 7518 traffic accidents occurred, of which 24 percent involved motorcycles. In Pokhara alone 172 persons died from motorcycle accidents alone in the past year [1].

According to the Lim-Quizon, the highest mortality rate was recorded for children between the ages of 1 and 4 years. The mortality rate was about 1.7 % followed by

children under the age of 1 year (1.1%) and then children between 10 and 15 years (0.9%) [2].

Next to the pedestrian group, motorcyclists are a growing concern. Over the past 3 years, the number of motorcycles grew by 40 % per annum. Among the causes of traffic accidents, police cited driver error, speeding and overtaking as major causes [2].

Table 1. Causes of Traffic Accident

Cause	Number	%
Driver Error	35	25
Drunk Driving	23	16.5
Mechanical Defect	3	2.2
Speeding	6	4.4
Using Mobile	2	1.4
Road Defects	6	4.4
Hit And Run	8	5.6
Overtaking	16	11.4
Turning	11	7.9
Overloading	9	6.3
Self Accident	16	11.4
Others	5	3.5
Total	140	100

In a retrospective, cross-sectional examination of the Illinois Department of Public Health Trauma Registry for demographic data, spinal injury, head injury, helmet use, days in ICU, hospital charges, and source of payment were selected as outcome measures. Of the total study population 18% were helmeted and 56% were non-helmeted. Among the helmeted patients 4 % sustained spinal or vertebral injury and 30% sustained head injury, compared with 8% and 51% respectively for non-helmeted patients. Non-helmeted patients were significantly more likely to sustain severe or critical head injury. Motorcycle trauma patients with severe or critical head injuries were admitted in the ICU and had significantly greater hospital charges than those with mild or no head injuries [3].

People used non-standard helmet depending on time of day, day of week and type of roadway. Head injuries were more frequent and of greater severity among those people who used non-standard helmets compared to both those not wearing helmet and those wearing standard helmets. In summary, nonstandard helmets appear to offer little or no head protection during a crash.

Chesham et al. analyzed the association of distance travelled by motorcycle with injuries sustained and concluded that during an accident a motorcyclist is 35 times more likely to be seriously injured or killed compared to a car driver. Although the statistics have improved over the past 10 years, the risk factors for motorcyclists to be seriously injured or killed when compared to car drivers is still very high [4].

In a study by Mannering et al, they pointed out several reasons for the characteristics of motorcycle accidents different from those of other motor vehicles. First of all, they claimed ‘car drivers tend to be attentive with motorcyclists and have conditioned themselves to look only for other (cars) as possible collision dangers’. They also concluded that operating a motorcycle is more complex task than driving a car, requiring excellent motor skills, physical balance and co-ordination. Riding a motorcycle can also involve counter-intuitive skills, such as ‘counter-steering, simultaneous application of (mechanically separate) front and rear brakes, and opening the throttle while negotiating turns’. Any impairment (physical or mental impairment, alcohol, medicines etc.) would therefore greatly affect a motorcyclist thus increasing the risk of an accident when compared with a similar level of impairment while car driving [5].

Everett et al. however, examined national trends in transportation- related injury risk and safety behaviors among US high school students, and they found that many young people place themselves at unnecessary risk from motor vehicle and bicycle related crash injuries and fatalities because of drunk driving and improper use of safety equipment [6].

2. Materials and Methods

A total of 140 motorcycle accident data were enrolled in our study. These included patients treated at the emergency room and patients admitted at Manipal Teaching Hospital from May 2015 to August 2015. The charts were filled up whenever a motorcycle accident came to our hospital. Compilation of data from the survey constitutes the bases of this study.

In a pilot study done prior to the original study with 10 sample size, it showed 90% were having injuries. With a 95% CI, the sample required was 42 [7].

Ethical clearance was taken from the ethical committee of our hospital before commencing of this study.

3. Results

Age frequency distribution of motorcyclists involved in motorcycle accidents showed 61(43.5%) at the age of 31-40 years old. It is also interesting to note that motorcyclists of age 21-30 years old 35(25%) ranked second in the series. Of these numbers, 121(86.4%) were males and 19(13.6%) were females which was mostly composed of unmarried adults 95(67.8%). (Figure 1)

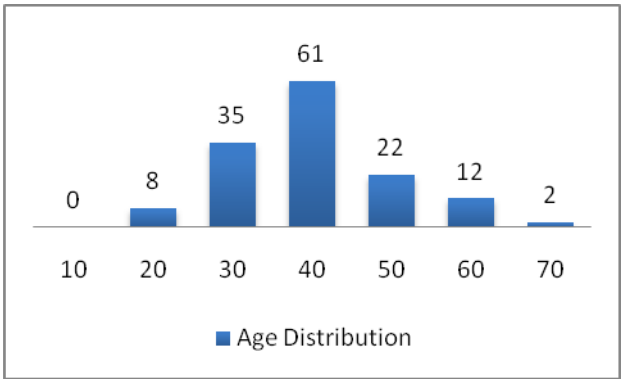

Figure 1. Age Distribution

The nature of motorcycle accidents comprised mostly of motorcycle and automobile interaction mechanisms which was about 72 (51.4%) of total recorded accidents. Other mechanisms which share an equal frequency in the study were motorcycle and motorcycle interactions and motorcycle and other vehicles. Single motorcycle accident was about 32 (22.8%). (Figure 2)

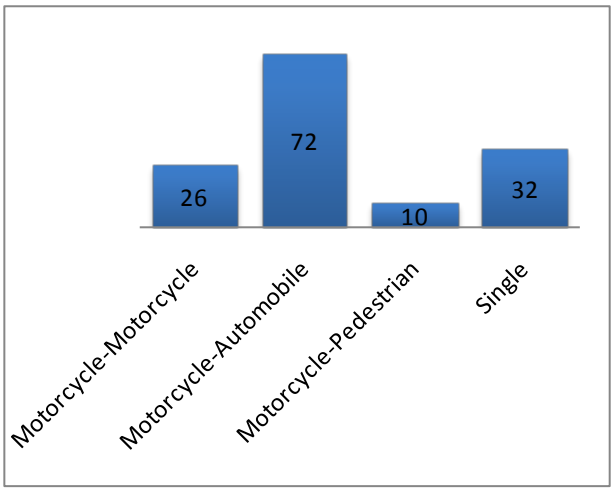

Figure 2. Nature of Motorcycle Accident

Motorcycles manufactured from India made up the bulk of this distribution 118 (84.2%) followed by motorcycles from Korea 15 (10.7%) and others 7 (5.1%). Major bulk of the motorcyclists were riding the motorcycle at a displacement of 50-70 km/hr (107) (76.4%) (Figure 3).

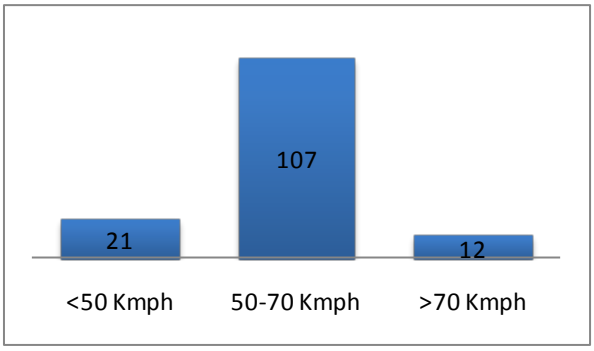

Figure 3. Displacement

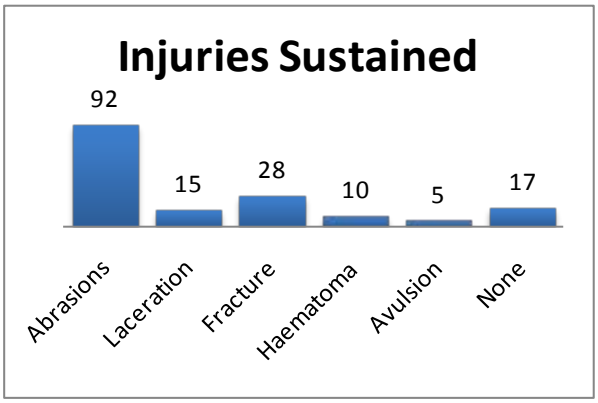

Figure 4. Injuries Sustained

The rider/ driver of the motorcycle was significantly involved among these accidents representing 106 (75.7%) of cases. Wearing helmets as a mandatory protective device represented at 128 (91.4%). A small portion of the distribution 12 (8.6%), did not wear helmets at the time of accident. Respondents who were under the influence of alcohol at the time of accident were 40 (28.6%) and those who did not have evidence of alcohol intake was 100 (71.4%). Non licensed holder rider/driver represented 22 (15.7%) of cases. 92 (65.7%) sustained abrasions as the predominant form of injury after the accident whereas only 17 (12.1%) did not incur injury from such accidents. (Figure 4).

Management of injuries were injury specific. Combination of pain relievers, antibiotics and anti-tetanus were used for open wounds and abrasions. Casting and stabilization for fractures, suturing for gapping wounds were done in the emergency room or operating room. Surgical intervention for both open wounds and fractures were done in 21 (15%) patients. Significant percentage of patients 116 (82.8%) seen at emergency room were discharged with home medications, wound care and follow up whereas 24 (17.2%) patients were admitted for observation and specific medical and surgical management. (Figure 5)

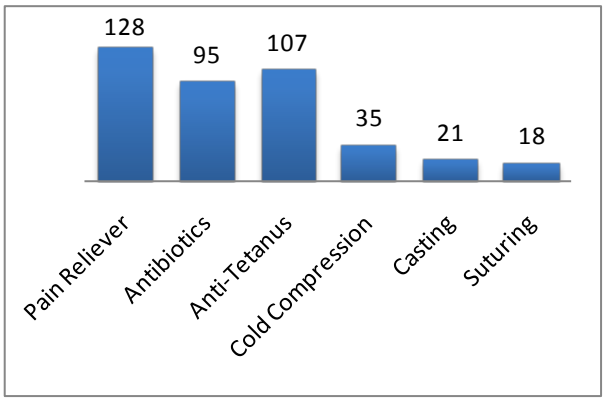

Figure 5. Management of Injuries

4. Discussions

Nepalese eye motorcycle as an option to an ever increasing transportation problem that our country faces. Entry of cheap motorcycles coupled with affordable payment schemes has brought a drastic rise in the number of motorcycles in the streets. Adults Nepalese ranging from 31-40 years old accounted to 43.5% of motorcycle accidents. Of these numbers, 86.4% were males which was mostly composed of unmarried young adults 67.8%. This data reflects that young adult males have a predilection for riding motorcycles. The nature of motorcycle accidents comprised mostly of motorcycle and automobile interaction.

Indian manufactured motorcycles with higher displacement range, peaked in sales among Nepalese. Value, design, ease of modification and easy payment schemes of these particular motorcycles are the reasons why it's very popular among the young adults. Alcohol influence (28.6%) and non helmet use (8.6%) constitute only a small percentage as a whole but is related to a more serious type of injuries and sometimes death. The rider (75.7%) is frequently injured in accidents. Overloading of single motorcycles is frequently observed in the villages.Our data was comparable to similar accidents in other countries and studies [8,9,10].

Unlike the Hurt report, our motorcycle drivers usually violate other vehicles right of way causing the accidents. Like Hurt's data local motorcycle riders involved in accident are essentially self-taught or learned from family members or friends. The positive alcohol intake is only

(28.6%) in our study while 50 % in Hurt's study. Since low powered motorcycles are used in our highways these contributes to major motorcycle injuries and even deaths [11].

Abrasions were the predominant form of injury after a motorcycle accident. Although there are variation of injuries attained by a person or a rider, these injuries may be in combination with Fractures, Lacerations and Hematomas. Treatment and management also vary with extent and nature of injuries. Pain relief, antibiotics, anti-tetanus vaccines and wound care was done for most less serious injuries. Fractures which required casting and stabilization were admitted. More attention was given for serious physical injuries which required surgery as a definitive therapy.

5. Conclusion

Of the total cases included in the study on the profile of motorcycle accidents, the following observation can be drawn. Males at the age of 31-40 years are at high risk of getting involved in Motorcycle accidents. Single type of motorcycle with a high displacement of 50-70 km/hr were at risk. Alcohol consumption, non helmet wearer and non licensed holder add to increased risk of accidents and injuries. Abrasions were predominant seen in these kind of motorcycle accidents but more attention should be given for serious physical injuries which entails surgery as a definitive treatment.

Recommendations

1. Public awareness regarding the use of safety protective gear or equipment among motorcyclists to decrease chances of injuries during accidents.
2. Implementation of strict government policies among operators of motorcycle vehicle.
3. Regular motorcycle driver seminar.
4. A longer study time to conduct an in-depth study to include risk factors, causes, fatalities and circumstances surrounding motorcycle accidents.

Declaration of Conflicting Interests

The authors declare that there is no potential conflicts of interest with respect to the research, authorship and /or publication of this article.

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