

Injury Pattern of Victims in Fatal Motor Bike Accident

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Abstract

Background: Road traffic accidents (RTA) are a major health problem worldwide, responsible for significant morbidity and mortality. The increase in the number of motorcycles circulating over the years is a consequence of the low cost, ease of locomotion and fuel efficiency of this vehicle.

Objective: To find out the injury pattern of victims in fatal motor bike accident in addition to socio-demographic characteristics of victims.

Methods and Materials: The cross-sectional study was conducted Sylhet M. A. G. Osmani Medical College Hospital, in Sylhet. Data were collected from the emergency unit and hospital ward registers. Information from the different unit & ward registers was entered into a standardized questionnaire. Data were collected by the study principal investigator, during study period from January 2021 to June 2021.

Results: More than two third (68.0%) victims belonged to age group 21-40 years. Male was found 49(98.0%) and 40(80.0%) were employer. Half (50.0%) of the victims were driver followed by 16(32.0%) were passenger and 9(18.0%) were pedestrian. Every victim has been injured in different parts of the body at the same time. Out of 50 patients, head injuries accounted for 49 (98 percent), thorax (chest) injuries for 44 (88%), abdominal injuries for 100%, and limb injuries for 27 (54%). Majority 47(94.0%) victims were alive and 3(6.0%) were death. In died patients, 1(33.3%) had severe haemorrhage and 2(66.7%) had craniocerebral injury.

Conclusion: Male was predominating, half of the victims were driver, and more common type of injury was Head, Thorax (chest), Abdomen and Limbs. Mortality rate was found 6% and most of them were craniocerebral injury.

Keywords: Road Traffic Accidents, hemorrhage, cranio-cerebral injury.

Introduction

Road traffic accidents (RTA) are a major health problem worldwide, responsible for significant morbidity and mortality.^{1,2} According to the recent Global Status Report on Road Safety (2018), RTA are the current leading cause of death for children and young adults (5-29 years) and the

eighth for all age groups.¹

The World Health Organization estimates that RTA will become the third leading cause of disability in the world by 2030.³ Therefore, the Sustainable Development Goal (SDG) target 3.6 has called for initiatives to halve the number of global deaths and injuries from RTA by 2020.⁴

Two-wheeled vehicles are increasing in number across the world especially in developing countries because compared to other vehicles, motorcycles are relatively cheap to own and operate.⁵

The increase in the number of motorcycles circulating over the years is a consequence of the low cost, ease of locomotion and fuel efficiency of this vehicle. However, this increase has grown proportionally to the number of traffic accidents, making them a major problem for public health worldwide, since they have been considered one of the main causes of morbidity and mortality in the world.⁶

The poor state of the roads in the country and the inefficiency of the public transportation system, as well as worsening vehicular congestion and increasing unemployment, are major reasons for the thriving motorcycle transport industry.⁷

Factors such as helmet wearing, use of alcohol and other

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drugs, inexperience of riders and poor driver training, conspicuity of the motorcycle and rider, issues of licensure and ownership, riding speed, and risk taking behaviour of riders have been identified as contributory factors to the increased risk of fatal motorcycle crashes.⁸

Motorcycle accidents are a major cause of RTIs and deaths. Almost half of individuals killed in road traffic accidents (RTAs) are motorcycle users.⁹ The problem is more pronounced in developing countries owing to many factors such as rapid motorization, using motorcycles for commercial transport, and failure of motorcyclists to wear protective helmets; the burden of motorcycle accidents is aggravated by the habit of reckless driving with tendency to over speed by some motorcycle riders, as well as a significant number of drivers lacking proper certification and valid licensing. Poor traffic regulations and law enforcement and the abuse of recreational drugs and alcohol are also major contributing factors to motorcycle accidents.^{10,11} The present study aimed to measure the magnitude of motor bike accident in the Bangladesh community and to determine the common patterns of major injuries after these accidents in patients attending the Sylhet M.A.G Osmani Medical College Hospital. The study also suggested possible counter measures and solutions to reduce the incidence and mortality of these accidents.

Materials & Methods

The cross-sectional study was conducted Sylhet M. A. G. Osmani Medical College Hospital, Sylhet. Data were collected from the emergency unit and hospital ward registers. Information from the different registers was entered into a standardized questionnaire. Data were collected by the study principal investigator, during study period from January 2021 to June 2021. Finally the size of the sample was 50 in number for investigation and selected purposively. Socio-demographic characteristics captured included age group, sex, occupation, and type of road user (pedestrian, car passenger, car driver, or motorcyclist (drivers) and motorcycle passengers). Clinical characteristics captured from medical record included type of injury (not injured, traumatic brain injury, wound, fracture, and two or more injuries), Glasgow Coma Score (classified as normal 15, mild coma 14–10, heavy coma, 9–7, or deep coma (6–3), and death (yes or no). Type of RTA was designated as involving a motorcycle or others (vehicle or bicycle). All deaths due to motorcycle accidents, being coroner's cases are usually accompanied by a duly signed order from a Coroner, requesting for an autopsy to be performed on the body. The coroner's papers contain information such as the name of the deceased (if known), sex, age, and residential address, place where the body was found and a report of the accident as documented in the extract from the police diary. The records of all deaths resulting from motorcycle accidents were extracted from the autopsy registers; further information was recovered from autopsy reports, hospital case notes, where

applicable, extract from police diary. The data retrieved were analysed using the IBM Statistical Package for Social Sciences (SPSS) version 23, and the results were presented in percentages, tables, pie charts and bar chart.

Results

Table 1: Socio-demographic characteristics of the victims (n=50)

Variable	Frequency	Percentage
Age (years)		
≤20	5	10.0
21-40	34	68.0
>40	11	22.0
Gender		
Male	49	98.0
Female	1	2.0
Occupational status		
Student	4	8.0
Employer	40	80.0
Unemployed	6	12.0

Table 1 shows majority victims (68.0%) were in age group 21-40 years, male (98.0%) and employer (80.0%).

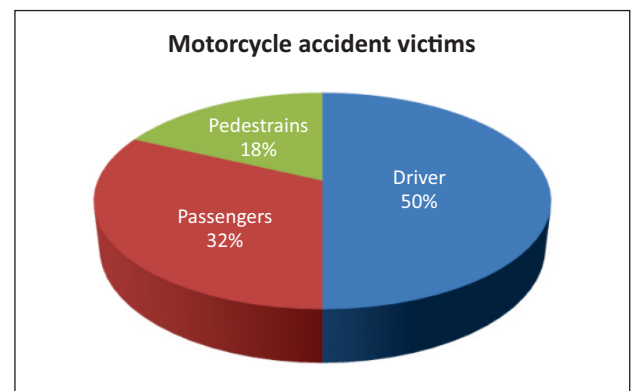


Figure 1: Pie diagram showing distribution of victims by types (n=50)

Table 2: Type of injury of the victims

Variable	Frequency	Percentage
Head		
Abrasion/laceration	15	30.0
Skull fracture (vault)	9	18.0
Skull fracture (base)	7	14.0
Intracranial haemorrhage	10	20.0
Brain injuries (contusion and laceration)	8	16.0
Thorax (chest)		
Abrasion/laceration	15	30.0
Lung laceration	10	20.0
Heart laceration	3	6.0
Vascular (aorta and jugular)	1	2.0
Rib fracture	15	30.0
Abdomen		
Abrasion/laceration	19	38.0
Liver laceration	13	26.0
Splenic laceration	10	20.0
Kidney laceration	3	6.0
Bowel perforation	5	10.0
Limbs		
Fracture pelvic	10	20.0
Fracture femur	7	14.0
Fracture radius	5	10.0
Fracture tibia	4	8.0
Fracture ankle joint	1	2.0

Every victim has been injured in different parts of the body at the same time. Out of 50 patients, head injuries accounted for 49 (98 percent), thorax (chest) injuries for 44 (88 percent), abdominal injuries for 100 percent, and limb injuries for 27 (54 percent). The most prevalent type of injury encountered in the head was a skull fracture (32.0 percent), which included vault (18.0 percent) and base of the skull fractures (14.0 percent). Abrasions and lacerations were discovered in 15 (30.0%) of the thorax and 19 (38.0%) of the abdomen. In limbs, ten (20.0 percent) were discovered to have pelvic fractures.

Table 3: Outcome the victims (n=50)

Variable	Frequency	Percentage
Death	3	6.0
Alive	47	94.0

Table 3 shows that majority 47(94.0%) victims were alive and 3(6.0%) were death.

Table 4: Cause of death the victims (n=3)

Variable	Frequency	Percentage
Severe haemorrhage	1	33.3
Cranio-cerebral injury	2	66.7

In died patients, 1(33.3%) had severe haemorrhage and 2 (66.7%) had cranio-cerebral injury.

Discussion

In this study showed that more than two third (68.0%) victims belonged to age group 21-40 years. Male was found 49(98.0%) and 40(80.0%) were employer. Faduyile et al.¹² reported the peak age of victims was 31-40 years (29.6%). There were 122 (86%) males and 20 (14%) females with Male: Female ratio of 6:1. An overwhelming male preponderance of between 87.9% and 90.8% were reported in studies in other parts of the world.^{13,14} Delamou et al.¹⁵ also compared to victims of other RTA, victims of motorcycle RTA were more likely to be male (73.5% vs. 63.6%) and youth (53.4% vs. 41.3% children or youth; median age 23 years (IQR 17-33). Occupational distribution differed significantly by the RTA type: the commonest occupational groups involved in motorcycle RTA were students (29.7%), employees (23.6%), and farmers/housewives (23.3%), while employees (24.9%) and farmers/housewives (22.2%) represented the most affected group for other types of RTA. Fouda et al.¹⁶ reported there were 181 (90.5%) males with a mean age of 30.7±10.5 years (range, 7-65years). Sharma et al.¹⁷ observed young adults of the age-group 21-25 years constituted the majority of the victims, 48 (36%) and the 16-30 year age group accounted for 98 (73%) motorized two wheeler deaths. The overall male: female ratio was 1.6:1.

In this study showed that half (50.0%) of the victims were driver followed by 16(32.0%) were passenger and 9(18.0%) were pedestrian. Faduyile et al.¹² reported majority of the victims 67 (47.2%) were Motorcycle riders, followed by pillion passengers who accounted for 48 (33.8%), while the remaining 27 (19.0%) of the victims were pedestrians. Delamou et al.¹⁵ regarding the type of road users, motorcyclists were predominant (50.7%) among motorcycle RTA victims, whereas car passengers represented the majority (89.3%) of victims of other types of RTA.

In current study showed that every victim has been injured in different parts of the body at the same time. Out of 50 patients, head injuries accounted for 49 (98 percent), thorax (chest) injuries for 44 (88 percent), abdominal injuries for 100 percent, and limb injuries for 27 (54 percent). The most prevalent type of injury encountered in the head was a skull fracture (32.0 percent), which included vault (18.0 percent) and base of the skull fractures (14.0 percent). Abrasions and lacerations were discovered in 15 (30.0%) of the thorax and 19 (38.0%) of the abdomen. In limbs, ten (20.0 percent) were discovered to have pelvic fractures. Faduyile et al.¹² reported analysis of head injuries shows that skull fracture was the commonest form of injury seen (32.7%), which comprises fracture of the vault (19.5%) and fracture of the base of the skull (13.2%). This was followed by abrasions and lacerations to the scalp and face, which accounted for 30.5%. This finding is similar to that of Nwadiaro et al.¹⁸ who reported that head injury constituted 40.1% of the injuries in a clinical-based study in Jos.¹⁸ Studies in Ghana by Kudebong et al.¹⁹ and Uganda by Kigera and Naddumba also showed that head injury was

the commonest type of injury, accounting for 32.2% and 20.0% respectively.^{19,20} The smaller figure reported in Ghana and Uganda when compared to this study may be due to a higher level of helmet use in those countries. Heydari et al. in a study in the Fars province in Iran observed that the head was the most frequently injured site (87.8%).²¹ They opined that helmet use among motorcycle occupants was very low in that area and that may readily explain this high level of head injury seen in that study. Delamou et al.¹⁵ the number of victims of motorcycle RTA who sustained two or more injuries was about four times higher than that of other RTA (5,091 vs. 1,461). Fouda et al.¹⁶ The most common pattern of injury in polytraumatized patients was combined head and orthopedic injuries in 30.4% of patients. Isolated head injuries were observed in 34 (56%), patients and combined head injuries (skull fracture with one or more types of hemorrhage) were seen in 27 (44.3%) patients.

Current study showed abrasions and lacerations was found 15(30.0%) in thorax. Faduyile et al. reported the most common thoracic injury in this study was rib fracture (46.7%). This is close to 40.3% reported by Sharma in Northern India¹³, and 45.9% reported by Kraus et al. in the US.²² Fouda et al.¹⁶ also observed 18(9%) patients had variable chest injuries, combined chest injuries were the most common pattern occurring in a third; 12 (67%) patients with chest injuries were managed conservatively and three of them died, whereas six (33%) patients required insertion of intercostal tube and only one of them died. There was no significant relationship between final outcome and the different types of chest injuries.

In this study abrasions and lacerations was found 19(38.0%) in abdomen. Faduyile et al.¹² reported the pattern of abdominal injuries in this study showed that lacerations to the liver were the most frequent visceral injury (16.7%), followed by injuries to the spleen and kidney which accounted for 13.6% and 7.6% respectively. Bowel perforation constituted only 10.6%. This general pattern is similar to the observation by Sharma in India, who reported the following pattern of abdominal injuries; liver laceration (27.6%), splenic laceration (20.1%), kidney rupture (10.4%) and intestinal perforation (4.5%).¹³ Similarly, Kraus et al. in the U.S reported that liver laceration was the commonest type of intra-abdominal injury in a fatal motorcycle accident, representing 31.8%.²² Fouda et al.¹⁶ reported Internal hemorrhage was diagnosed in 17 (9.5%) patients by FAST; 11 (65%) of these patients were admitted to the ward, and four patients to ICU.

In present study showed 10 (20.0%) was found fracture pelvic in limbs. This is very similar to the finding by Heydari et al. which was 9.8%.²¹ This study showed that fracture of the humerus accounted for 8.3%, a figure very close to 9.7% reported by Sharma et al. in India.¹³ Lower extremity injuries accounted for 18.2% of the injuries seen in this study, comparable with 14.8% reported by Heydari et al.²¹ On the other hand, Solagberu et al. reported that lower extremity was the most frequently injured part of

the body in motorcycle accidents, representing 70.5%.²³

In this study showed that majority 47(94.0%) victims were alive and 3(6.0%) were death. Sharman et al. in India opined that motorcycle accident deaths among females were mainly due to the act that nearly all female pillion riders sit sideways with both legs to the left of the vehicle because the common mode of dress, the sari, prevents them from sitting astride and they do not wear helmets.¹³ Delamou et al.¹⁵ reported overall, 4.4% of RTA victims died; mortality was 1.1% amongst motorcycle RTA victims compared with 3.3% amongst other RTA victims ($P < 0.001$). Fouda et al.¹⁶ reported 82.5% of the studied patients were admitted to the ward and 13% required ICU admission, with an overall mortality rate of 4.5%.

In died patients, 1(33.3%) had severe haemorrhage and 2(66.7%) had craniocerebral injury. Faduyile et al.¹² reported majority of the victims, 72 (50.7%) died of Craniocerebral injuries. This is consistent with the findings in some studies from within Nigeria and from other parts of the world with frequency ranging from 33.3% to 87.8%.^{21,24} Nzegwu et al.²⁵ in Benin City observed that none of the dead victims in their study wore a crash helmet at the time of the accident.

Conclusion

Male was predominating, half of the victims were driver, and more common type of injury was Head, Thorax (chest), Abdomen and Limbs. The fact that majority of victims die of head injuries also signals the need for more research efforts geared towards head protection for motorcycle riders and passengers. Mortality rate was found 6% and most of them were craniocerebral injury.

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