

Original Article

Forensic Profiling of Road Traffic Accident Victims- A Retrospective Study

Nazmun Nahar Nahida¹, Kishoara Binte Quader², Laila Yesmin³, Alamgir Hossain⁴, Borhan Uddin Ahamed⁵

¹Assistant Professor, Department of Forensic Medicine and Toxicology, Monno Medical College, Manikganj; ²Associate Professor, Department of Forensic Medicine and toxicology, Delta Medical College, Mirpur-1; ³Associate Professor, Department of Forensic Medicine and Toxicology, Khwaja Yunus Ali Medical College, Enayetpur, Sirajganj; ⁴Lecturer, Department of Forensic Medicine and Toxicology, Monno Medical College, Manikganj. ⁵Professor and Head, Department of Forensic Medicine and Toxicology, Monno Medical College, Manikganj.

Abstract

Background: Road traffic accidents (RTAs) have become a significant public health problem that requires a multi-disciplinary strategy to solve. Every year, 1.35 million people die because of RTAs. The effects of a traffic accident not only cause the sufferer to suffer physically, emotionally, and financially, but they also have a deadly impact on the way the entire family functions. **Objectives:** This study's objective was to assess the current RTA situation in Manikganj district, determine the injury pattern, explore the causes and frequency of accidents, and find out the sociodemographic characteristics of the victims. **Methodology:** This retrospective study was carried out in the Manikganj District hospital, Bangladesh, during the period of January, 2019 to December, 2020. **Results:** During the study period, there were 381 postmortems performed, of which 83 (21.78%) instances involved RTA. Of the victims, 49(59.04%) were men and 34(40.96%) women. Incidence of RTA (24, 28.91%) was the highest among people aged 21 to 30 years. The most accidents happened during the daytime (32, 38.55%). All victims sustained many abrasions and bruises (83, 100%), laceration was present in 46(55.42%), fractured ribs in 33(39.75%), fractured hipbones in 32(38.55%), skull bones fractured in 16(19.27%), head injury in 26 (31.32%) and intracranial haemorrhages in 26(31.32%) cases. Most victims (59, 71.08%) were pedestrians, followed by passengers and drivers. In 83 instances, head injuries accounted for most fatalities (22, 26.53%), followed by multiple traumas, haemorrhagic shock, spinal cord damage, septic shock and crush syndrome. **Conclusion:** Strict adherence to traffic laws, public awareness campaigns, and adequate driver training all reduce the likelihood of road accidents and lessen their severity.

Key Words: Forensic profiling; Road Traffic Injuries; Retrospective

Received: : 07 October, 2023; **Manuscript ID:** 11491023OA; **Accepted:** 15 November, 2023

DOI: <https://doi.org/10.3329/jmomc.v9i2.75897>

Correspondence: Dr. Nazmun Nahar Nahida, Assistant Professor, Department of Forensic Medicine and Toxicology, Monno Medical College, Monno City, Gilondo, Manikganj, Bangladesh. E-mail: nahidanazmun3@gmail.com, Cell: +880 1791-925583.

How to cite this article: Nahida NN, Quader KB, Yesmin L, Hossain A, Ahamed BU. Forensic Profiling of Road Traffic Accident Victims- A Retrospective Study. J Monno Med Coll. 2023 December;9(2):53-57.

Copyright: : This article is published under the Creative Commons CC BY-NC License  (<https://creativecommons.org/licenses/by-nc/4.0/>). This license permits use, distribution and reproduction in any medium, provided the original work is properly cited, and is not for commercial purposes.

Introduction:

Many people's lives and society overall have been improved by motorization, yet there is a cost associated with these advantages. For most of the world's population, the burden of road traffic injury—in terms of social and economic costs—is rising significantly, even though the number of lives lost in road accidents in high-income nations indicates a declining trend in recent decades.¹

With 165 million inhabitants, Bangladesh is a heavily populated nation. At least 21 fatalities are thought to occur daily in the capital city.²

Road traffic accidents (RTAs), which account for more than 85% of all fatalities and 90% of years lost to disability-adjusted life expectancy, are a significant public health issue in developing nations.¹ The RTA was also found to pose as a larger financial burden on the

community than any other serious illness would. The RTAs were considered as a global health, economic and social catastrophe. It was identified as the 8th leading cause of death and accounted for approximately 1.35 million deaths in 2016 and 20-50 million non-fatal injuries annually globally.³ The RTA was the second leading cause of death in Bangladesh, including both fatal and non-fatal injuries.⁴ The RTAs were the main cause of hospitalization in primary and secondary facilities in Bangladesh.⁵

Bangladesh is a heavily populated nation where individuals from rural areas migrate to the cities due to unemployment and poverty. This highest rate of RTAs in urban locations may be attributed to poorly designed roads and highways, a dysfunctional traffic system, driver and pedestrian infractions of the law, congestion from excessive traffic, irresponsible driving, etc.⁶

Reckless driving, failure to adhere to traffic regulations, overloading of transport vehicles, poor vehicle maintenance, driver fatigue, alcohol use, a lack of awareness among road users, including drivers and pedestrians, poor weather conditions, and a failure to use safety equipment such as seat belts and helmets are some of the causes of the rise in accidents and fatalities.⁷ When a car collides with another car, a person, an animal, a piece of road debris, or another stationary object like a tree or utility pole, a road traffic accident occurs. Pedestrians, cyclists (pedal or motor), and drivers and passengers of vehicles make up the three main categories of people injured in traffic accidents. Among these three major categories, injuries to pedestrians occur most frequently.⁸

This study was conducted to analyze the nature, distribution, and types of injuries sustained after catastrophic road traffic incidents as well as the detailed socio-demographic profile of the unlucky victims to potentially take preventive action.

Methodology

This retrospective cross-sectional study was conducted in Manikganj District Hospital, Bangladesh during the period of January, 2019 to December, 2020. Ethical clearance was duly approved by ethics review committee of Monno Medical College. The material of this study included 83 dead bodies of road traffic accident (RTA), which were brought to Manikganj District Hospital mortuary for postmortem examinations. A thorough, extensive, and meticulous postmortem examination of the dead bodies were carried out at the study place.

Data on gender, age, time, type of road user, pattern of injury and cause of death were collected from inquest reports, challan, autopsy reports, hospital records and case files. These data were then compiled, analyzed by using descriptive statistics and tabulated. Statistical analysis was performed using window-based computer.

Results

Out of 381 post-mortems completed during the study period, 83(21.78%) were Road traffic accident (RTA) cases. Among them, majority (49, 59.04%) were male and 34(40.96%) were female. (Table I)

Table I: Distribution according to sex of the victims (n=83)

Sex	Frequency	Percentage
Male	49	59.04%
Female	34	40.96%
Total	83	100%

The highest incidence of RTA (24, 28.91%) was observed in the age group of 21-30 years, followed by 19 (22.90%) among age group 31-40 years and 41-50 years (11, 13.25%). (Table II)

Table II: Age wise distribution of RTA victims (n=83)

Age group (years)	Frequency	Percentage
0-10	04	4.82%
11-20	11	13.25%
21-30	24	28.91%
31-40	19	22.90%
41-50	11	13.25%
51-60	08	9.64%
>60	06	7.23%
Total	83	100.00%

Most of the accidents happened during daytime 32(38.55%), followed by evening 28(33.73%). (Table III)

Table III: Distribution of time of RTAs (n=83)

Time of accidents	Frequency	Percentage
Morning, 05:01-08:00 hrs	14	16.88%
Day time, 08:01-18:00 hrs	32	38.55%
Evening, 18:01-19:30 hrs	28	33.73%
Night, 19:31-05:00 hrs	09	10.84%
Total	83	100.00%

Regarding the pattern of injuries, we observed that all 83(100.00%) victims had multiple abrasions and bruises all over the body, 46(55.42%) had lacerations in different parts of the body, followed by fracture of lower limbs (52, 62.65%), fracture of upper limbs (48, 57.83%), head injury (26, 31.32%), intracranial haemorrhage (26, 31.32%), injury to abdominal viscera (11, 13.25%) and other fractures on limbs. (Table IV)

Table IV: Distribution of pattern of injury in victims (n=83)

Pattern of injury	Frequency	Percentage
Multiple abrasions	83	100.00%
Multiple bruise	83	100.00%
Laceration	46	55.42%
Fracture of hip bone	32	38.55%
Fracture of ribs	33	39.75%
Fracture of sternum	18	21.68%
Fracture of skull	16	19.27%
Head injury	26	31.32%
Intracranial hemorrhage	26	31.32%
Injury to abdominal viscera	11	13.25%
Fracture of upper limbs	48	57.83%
Fracture of lower limbs	52	62.65%

Regarding the type of victims, the most common victims of RTA were pedestrians (59, 71.08%) followed by passengers (17, 20.48%) and drivers (07, 8.44%). (Table V)

Table V: Distribution according to type of victims (n=83)

Type of victims	Frequency	Percentage
Pedestrian	59	71.08%
Passenger	17	20.48%
Driver	07	8.44%
Total	83	100

Majority of the 83 RTA victims died due to head injury (22, 26.53%), followed by multiple trauma (19, 22.89%), haemorrhagic shock (18, 21.68%), spinal cord injury (12, 14.45%), septic shock (08, 9.63%), and crush syndrome (04, 4.82%). (Table VI)

Table VI: Distribution of RTA victims according to cause of death (n=83)

Cause of death	Frequency	Percentage
Hemorrhagic shock	18	21.68%
Head injury	22	26.53%
Multiple trauma	19	22.89%
Spinal cord injury	12	14.45%
Septic shock	08	9.63%
Crush syndrome	04	4.82%
Total	83	100.00%

Discussion

Out of the 83 victims in this study, majority (49, 59.04%) were men and other 34(40.96%) were women. These findings concur with a study by Karim et al reported in 2011 that found that only 8% of RTA casualties were female and that 47% of victims were men.⁹ This is likely because men in Bangladesh are more exposed to the outdoor activities and are frequently on the go due to their employment, businesses, jobs, or studies, whilst women are frequently confined to their homes and other responsibilities for taking care of household duties.¹⁰ As the primary breadwinner in our society, men are more likely than women to sustain injuries. Additionally, they are more exposed to the traffic and engage in riskier activities than the women- like as rushing to catch a bus, clinging to the side of the vehicle, being impatient and inattentive, and drinking alcohol (in the case of drivers) before operating a motor vehicle.⁶

In this study, the age group of 21 to 30 years had the highest incidence of RTA 24 (28.91%), followed by the age groups of 31 to 40 years (19; 22.90%) and 11 to 20 years (11; 13.25%). This is consistent with other study findings, which state that those aged 15 to 44, who are often the most productive workers, account for more than half of all traffic-related deaths worldwide. Additionally, this age group's handicap burden accounts for 60% of all DALYs lost in road traffic accidents. Other studies from developing nations have revealed similar age distributions of RTA casualties.¹¹⁻¹⁵

Maximum accidents happened during the daytime, when there was a rush of people heading to workplaces, schools, and businesses, with 32 (38.55%) occurring during the day and 28 (33.73%) during the evening. The causes of accidents at night may include drivers' propensity for dozing off at night, poor vision, a lack of luminescent markings on the road, potholes and open manholes, vehicle overtaking, and an increase in the number of cargo vehicles on the road.¹⁶

Considering the patterns of injury in this study, all 83 (100%) individuals had several abrasions and bruises, laceration 46(55.42%). Numerous fractures, including those of the ribs 33 (39.75%), hipbones 32 (38.55%), and skull bones 16 (19.27%), as well as head traumas and intracranial hemorrhages 26 (31.32%) were found, among other injuries to the body. Similar findings were reported by ASMJ Chowdhury published in 2012,¹⁶ who reported that 3(6.38%) RTA victims had pelvic fractures in addition to 56(100%) patients who had various abrasions and bruises, head injuries in 21(44.68%), and other injuries. Due to a fall to the ground and a quick automobile hit, internal damage to the abdominal organs also occurred. Most crush injuries caused by car wheels result in fractures of the upper and lower extremities. Due to a fall to the ground and a sharp impact, there is a fracture and haematoma over the skull. The most frequent type of fracture was linear, which was brought on by RTA, heads being forcibly brought into contact with hard surfaces like roadways.^{16,17}

Pedestrians in the present study made up most RTA victims [59(71.08%)], followed by passengers 17(20.48%) and drivers 07(8.44%). Due to their ignorance of traffic regulations and lack of space in sidewalks, people frequently walk on the pavement, endangering both themselves and cars. Similar research was conducted in India, where it was discovered that out of the 1872 RTA cases, there were 880(47.01%) pedestrian cases and 517(27.61%) vehicle cases, 266(14.20%) driver cases, 196(10.47%) bicycle cases, and 13(0.69%) cases that were undetermined.¹⁸ According to the RTA Report released by the Road Safety Cell of Bangladesh, pedestrians make up 49% of road accident victims in Bangladesh, followed by passengers (37%), and drivers (14%). Studies in Brazil, Mexico, and Uganda indicated that even when such choices increased the risk of injury, pedestrians preferred to cross a risky road rather than make the extra effort to use a pedestrian bridge.¹⁹

The head injury was the most common cause of death for RTA victims, accounting for 22 cases (26.53%), followed by multiple trauma 19 cases (22.89%), haemorrhagic shock 18 cases (21.68%), spinal cord injury 12 cases; (14.45%), septic shock 08 cases (9.63%), and crush syndrome 04 cases (1.54%) out of a total of 83 cases. Similar research from India found that among the 98 cases of RTA victims, most deaths were attributable to head injuries in 46 cases (46.93%), polytrauma in 34 cases

(34.69%), haemorrhagic shock in 14 cases (14.28%), spinal cord damage and complications in 2 cases each, totalling 2.04%.¹⁵

This study has limitations of being conducted at the District Hospital in Manikganj, Bangladesh, that may not reflect the country situation. To find out the overall picture and determinants of road traffic accidents in Bangladesh, a more thorough study is required.

Conclusion

A remarkable portion of the postmortems were due to road traffic accidents (RTA). Deaths of RTA cases occurred due to head injury and other reasonable causes, losing bread-earning members of the families. These losses finally might be responsible for multidimensional miseries in the families. It is possible to lessen this financial burden and protect the most vulnerable groups of people by strictly enforcing traffic laws, promoting efficient patterns of land use, and providing shorter, safer routes for vulnerable pedestrians to reduce their exposure to high roads. A community clinic might be built next to the road to cut down on the number of victims. There should be more traffic police on the road. It is necessary to increase public awareness of traffic accidents and road safety through motivating programs, driver training, removing unsafe vehicles from city streets, mending roads, etc.

Conflict of Interest: None declared.

References

1. Gopalakrishnan S. A public health perspective of road traffic accidents. *J Family Med Prim Care*. 2012 Jul;1(2):144-150. Doi: 10.4103/2249-4863.104987. PMID: 24479025; PMCID: PMC3893966.
2. Islam F, Khan NT, Mahmud S, Shahid F, Mondal MA, Munmun S. Road traffic accidents, the leading cause of death: A retrospective study. *J ZH Sikder Women's Med Coll*. July 2021;3(2): 26-29.
3. World Health Organization (WHO). Global Status Reports on Road Safety 2018. Geneva, Switzerland: WHO; 2018. Available online at: <https://www.who.int/publications/i/item/9789241565684>. [Viewed on 15 may, 2021]
4. Alonge O, Agrawal P, Talab A, Rahman QS, Rahman AF, Arifeen SE, et al. Fatal and non-fatal injury outcomes: Results from a purposively sampled census of seven rural subdistricts in Bangladesh. *Lancet Glob Health*. 2017;5: e818-27.

5. Mashreky SR, Rahman A, Khan TF, Faruque M, Svanstrom L, Rahman F. Hospital burden of road traffic injury: Major concern in Primary and Secondary level hospitals in Bangladesh. *Public Health*. 2010 Apr; 124(4):185-189.
6. Nantulya VM, Reich MR. Equity dimensions of road traffic injuries in low- and middle-income countries. *Inj Control Saf Promot*. Mar- June 2003;10(1-2):13-20.
7. Staff Correspondent. Monitoring lapses and indifference to blame. www.thedailystar.net. E-paper. January 5, 2020. [viewed on 27 July 2021]
8. Simpson R. *Transportation Injuries in Simpson's Forensic Medicine*, 12th edition. London, UK: London,2003; p.87-90.
9. Karim M, Khan AW, Farah S. Economic Impact of Road Traffic Accident on Patients Attending at National Institute of Traumatology & Orthopedic Rehabilitation (NITOR), Dhaka. *Ibrahim Card Med J*. 2011;1(2):45-49.
10. Islam MR, Khan MMA, Hossain MM, Mani KKC, Min RM. Road Traffic Accidents in Bangladesh: Why people have poor knowledge and awareness about traffic rules? *Int J Crit Illn Inj Sc*.2020 Apr-Jun;10(2):70-75.
11. Romao F, Nizamo H, Mapasse D, Rafico MM. Road traffic injuries in Mozambique. *J Control Saf Promot*. 2003;10(1-2):63-67.
12. Maheshwari J, Mohan D. Road traffic injuries in Delhi: A hospital-based study. *J Traffic Med*. 1989;17(3-4):23-27.
13. Hajar M, Carrillo C, Flores M, Anaya R, Lopez V. Risk factors in highway traffic accidents: a case control study. *Accid Anal Prev*. 2000;32(5):703-709.
14. Mock CN, Forjuoh SN, Rivara FP. Epidemiology of transport related injuries in Ghana. *Accid Anal Prev*. 1999;31(4):359-370.
15. Ahmad M, Rahman FN, Rahman MZ, Biswas P. Road traffic injury among pedestrians: an emerging research focus in Bangladesh. *Kwaja Yunus Ali Med Coll J*. 2018 May 9;9(1):11-15.
16. ASMJ Chowdhury. Road Traffic Accidents by 'Nasimon' and 'Karimon'-A Study in Faridpur Medical College Hospital. *Faridpur Med Coll J*.2012;7(1):06-09.
17. Singh YN, Bairagi KKR, Das KC. An Epidemiological Study of Road Traffic Accident victims in medico-legal autopsies. *J Ind Acad Forensic Med*. 2005; 27(3): p.p: 166-169
18. Martha H. "Pedestrian Traffic Injuries in Mexico: A Country Update," *Injury Control and Safety Promotion* 2003;10(1-2):37-43.
19. Farooqui JM, Chavan KD, Bangal RS, Syed MMA, Thacker PJ, Alam S, et al. Pattern of injury in fatal road traffic accidents in a rural area of Western Maharashtra, India. *Australas Med J*. 2013;6(9):476-482.