

Original Article

Pattern of Injuries in Fatal Railroad Accident in Dhaka Medical College Mortuary-An Autopsy Based Study

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Abstract:

Objectives: Objectives of this study are to find out the pattern of injuries presented among the railroad accidents victims along with related causes and to evaluate the present situation of railroad accidents in our country.

Material and Methods: This is a retrospective study which was carried out on 100 cases of fatal railroad accidents brought to the mortuary for autopsy in the Department of Forensic Medicine & Toxicology, Dhaka Medical College, during the period from 1st October 2017 to 30th September 2018.

Results: A total of 100 post mortem cases were studied. Among these 81% were male and 19% were female. Highest incidence of railroad accident was observed among the age group 21 to 40yrs (48%), followed by 41 to 60yrs (36%), 0 to 20yrs (11%) and above 60(5%). Regarding religion almost all cases were Muslim (92%) whereas 5% were unknown and 3% were Hindu. Among these 55(55%) dead bodies were identified and 45(45%) cases were unidentified. The victims of fatal railroad related deaths mainly succumbed to head injury (71%) followed by injury to thoraco-abdominal organs (15%), multiple injuries (11%) and septicemia (3%). Regarding injury pattern in different parts of the body, 100% victims had multiple abrasion and bruises all over the body, fracture were present in (87%) cases, (67%) victims had laceration in different parts of body, (47%) had injury to different organ, (5%) victims had decapitation, (5%) victims had amputation of limbs.

Conclusion: It can be concluded from the present study that accidental railway deaths in future can be reduced by implementing safety measures such as improved integrated surveillance system and safety engineering techniques, reduced public access to railway tracks by strict vigil, security measures, and better law enforcement at stations.

Key Words: Railroad accident, Injury, Autopsy.

Introduction:

Bangladesh railway (BR) has a total length of around 2955 route kilometers at the end of the years 2017-2018 that transported 90.05 million passengers and 4554.4 thousand metric ton freights that year. Bangladesh Railway is divided into two zones i.e. East zone & West zone comprising 466 railway stations.¹ The railway is considered one of the safest modes of transportation since the dawn of the invention of this mode of transportation. High numbers of accidents in rail has become a serious concern and people gradually losing their trust to choose the railway as their trusted mode of

transportation for long-haul journeys. At the same time, this is creating more pressure in an already exhausted transportation system and adding numbers to the death toll became of accidents.² The term accident has been defined as an occurrence in the sequence of events which usually produces unintended injury, death or property damage.³ In developed countries, they are the most common cause of death below the age of 50 years, and in young men this trend is even more marked.⁴ Railway injuries are not uncommon, especially in countries with many 'level crossing', where a public road crosses a railway track with either no

barrier at all or with only a flimsy lifting pole.⁵ Trauma related to railway accident victims is instantly fatal and extremely mutilated. Certain features such as wheel marks on the body, dirt and grease contamination and the manner of severance of tissues deserve special observation to rule out criminal violence.⁶ Trains are a common means of committing suicides owing to easy availability and higher chances of mortality. Apart from this, train accidents can also be used as a means of masking homicidal deaths to mimic the event as an accidental or suicidal railway death. Many of these fatalities do not raise any medico-legal questions as most of these events are witnessed, but in some cases the expertise of an autopsy surgeon is sought for a legal conclusion for the manner and nature of the injuries sustained. Cases of deaths due to railway injuries are important in respect to medico-legal investigation to find out the underlying cause and manner of death.

Fatal railroad injuries may be sustained in the following way:

01. While walking along the rail or track
02. While crossing the rail or track
03. Jumping in front of running train
04. When a person is pushed suddenly in front of a running train
05. When a suicide lies down on the railway track when a train is coming
06. When an unconscious person is laid on the track
07. When a person accidentally falls or intentionally jumps or is pushed down from a running train
08. When the head or some others part of the body is extended out of the door or window of a running train.
09. When two trains collide
10. When train is derailed
11. When there is outbreak of fire in running train
12. When passengers standing on the roof of the train are electrocuted by the high tension live wire carrying electric current or are struck against an overhead structure, e.g. an over bridge.⁷

Material and Methods

This is a retrospective study was carried out on 100 cases of fatal Rail road accidents brought to the mortuary for autopsy in the Department of Forensic Medicine & Toxicology, Dhaka Medical College, during the period from 1st October 2017 to 30th September

2018. The information regarding age, sex, religion, date and time of accident and death was gathered from relatives, police inquest report, dead body challan and clinical details from hospital records. During autopsy, detailed examination was carried out and data regarding both external and internal injuries was carefully recorded and analyzed.

Results

A total of 100 post mortem cases were studied. Among these 81% were male and 19% were female (Figure-I). Highest incidence of Railroad accident was observed among the age group 21 to 40yrs (48%), followed by 41 to 60yrs (36%), 0 to 20yrs (11%) and above 60(5%)(Table-I). Regarding religion almost all cases were Muslim (92%) whereas 5% were unknown and 3% were Hindu (Figure-II). Among these 55(55%) dead bodies were identified and 45(45%) cases were unidentified (Table-II). The victims of fatal railroad related deaths mainly succumbed to head injury (71%) followed by injury to thoraco-abdominal organs (15%), multiple injuries (11%) and septicemia (3%) (Figure-III). Regarding injury pattern in different parts of the body, 100% victims had multiple abrasions and bruises all over the body, fracture were present in (87%) cases, (67%) victims had laceration in different parts of body, (47%) had injury to different organ, (5%) victims had decapitation, (5%) victims had amputation of limbs (Table-III).

Table-I: Age distribution of Railroad accident victims (n=100)

Age in years	Numbers of victims	Percentage
0-20	11	11
21-40	48	48
41-60	36	36
>60	5	5

Table-II: Identity status of victims (n=100)

Identity status	Numbers	Percentage
Known	55	55
Unknown	45	45

Table-III: Distribution of injury pattern on the body of victims (n=100)

Types of injury	Numbers of victims	Percentage
Multiple abrasion	100	100
Multiple bruise	100	100
Fracture	87	87
Laceration	65	65
Organ rupture	47	47
Decapitation	5	5
Amputation of limbs	5	5

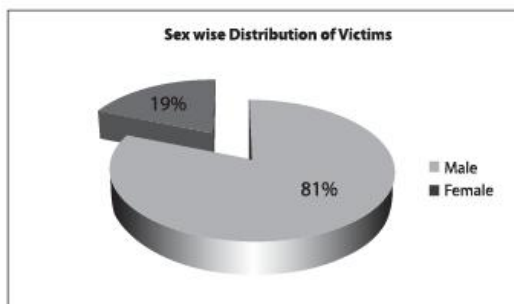


Figure-I: Sex wise Distribution of Victims

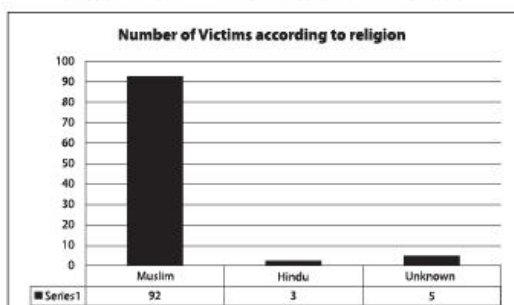


Figure-II: Number of Victims according to religion

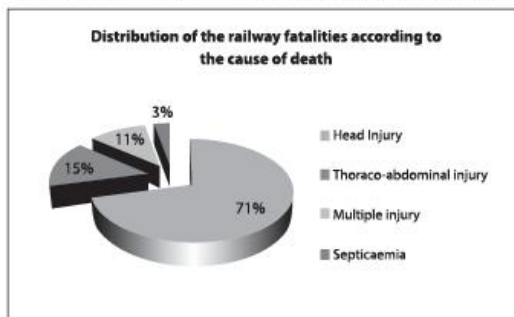


Figure-III: Distribution of the railway fatalities according to the cause of death

Discussion

Deaths have occurred in association with railways since the inception of the railway industry. Trains are one of the important modes of transport in our country and have become part of the day-to-day life of the people.⁸ The study was carried out on 100 cases of fatal Rail road accidents brought to the mortuary for autopsy in the Department of Forensic Medicine & Toxicology, Dhaka Medical College, during the period from 1st October 2017 to 30th September 2018. In the present

study, males are the commonest victims (81%) of railway related death which is in accordance with the study conducted by other authors.⁸⁻¹² Males being the working group prefer railways as the cheap, quick and comfortable mode of transport for traveling from one place to another and are therefore more vulnerable than females. On the contrary, females are involved in various indoor activities mostly due to cultural background and extra precaution taken by family members to keep them safe. (Figure-I)

In our study, the age group most commonly associated with railway related death was between 21-40 years and significantly less in the extreme ages. This age group is more vulnerable, as it is the age for marriage and settlement. In this modern era where there is struggle in each and every step of life and increased stress for early settlement, little failures combined with other factors compel the victim to take decision for ending his life. This corresponds with other studies undertaken.⁸⁻¹² (Table-I)

In our study most of the victims who succumbed to death due to railway injuries belong to Muslims followed by Hindus (Figure-II). This can be explained by higher density of Muslim population in the study region than other communities.

In the present study, 55% of railway fatalities autopsied were identified and remaining 45% dead bodies were unidentified until the time of postmortem examination. (Table-II)

Most common cause of death in our study was head injury (71%) which results instantly death to victims. It was followed by injury to vital thoraco-abdominal organs (15%) followed by multiple injuries (11%), septicemia (3%). This is quite corresponds with other studies undertaken.⁸⁻¹² (Figure-III)

In spite of various measures taken by the railway department to reduce the railway related deaths like displaying signboards, construction of overhead pathways, manned crossing levels, advertisement in electronic media, frequent announcement of upcoming trains at railway stations most of the victims fail to comply with. Victims when under the influence of alcohol lack self-control and capacity to judge, are either unaware of the upcoming train or unable to judge on which track train is moving sustain fatal trauma.¹¹

Regarding injury pattern in different parts of the body, all the victims had multiple abrasion and bruises all

over the body followed by fracture were present in (87%) cases, (67%) victims had laceration in different parts of body most likely due to primary and secondary impact injuries, (47%) had injury to different organ mostly intra-abdominal solid organs, (5%) victims had decapitation, (5%) victims had amputation of limbs. This is quite corresponds with other studies undertaken.⁸⁻¹² (Table-III). Greater public awareness needs to be created by educating the public about the dangers of railway trespassing. These measures, together with improved railway design may help to reduce the fatalities and financial loss incurred by the Railway department.

Conclusion

For a country densely populated country like Bangladesh, railways can be the only sustainable mode of transportation for mass transit. An increasing number have already taxed the capacity of the roadways hence the government of Bangladesh has taken up some mega projects to increase the connectivity & capacity of Bangladesh railway. So to ensure safety & reliability is of paramount importance right now. Corrective approaches can lessen the number of train accidents, specially the numbers of derailments, and consequently railway can become the mode of choice for long-haul journeys. Strict enforcement of railway safety regulations and improving emergency medical services may prevent untimely deaths and disabilities.

Recommendation

- A boundary wall on both sides of the track wherever possible would be erected and existing wall be repaired.
- Fencing should be done around the rail track and between the two railway tracks, especially within city limits to prevent suicides having easy access to it.
- By means of posters and advertisements in the media, people should be encouraged to use over bridges/under bridges at railway stations instead of using shortcuts of crossing rail tracks.
- The fact that the economically productive age-group are mostly involved, an urgent public policy response with special reference to education, engineering, environment, and emergency care.
- Self-vigilances, adherence to the rules/ regulations.
- Awareness campaigns concerning safety rules targeted at the high-risk groups.
- The autopsy surgeon should be well versed with the pattern of injuries which is very important to help the law governing authorities to reach a definite conclusion. It can be concluded from the present

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study that accidental railway deaths in future can be reduced by implementing safety measures such as improved integrated surveillance system and safety engineering techniques, reduced public access to railway tracks by strict vigil, security measures, and better law enforcement at stations.

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