

Railroad: A Riding Track Or Journey To Death

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ABSTRACT

Background & Objectives: Jaipur is the busiest railway station in the northwestern Indian region, series of railway accidents occurs in day to day scenario, leading to the loss of a significant number of human lives. No data pertaining to this region are available till date. Our research is aimed to assess the burden and profile of railway traffic fatalities in northwestern India. **Methods:** Descriptive, observational study conducted at the Department of Forensic Medicine, S.M.S. Medical college and attached hospitals, Jaipur (a tertiary health care center) during period of May'2014 to November'2015. **Results:** A total of 5828 medico-legal autopsies were conducted at the departmental mortuary, among them, 126 cases were of railway related deaths. The majority of the victims were young males with peak incidence in the age group of twenties and commonly students. Males, married, literate and rural population dominated our study. Frequent manner of deaths was accidental and took place on the railway tracks. **Interpretation & Conclusion:** Most of the railway fatalities were accidental in nature and in bread earning age group with a male preponderance. Our study may help to formulate preventive measures that could possibly prevent railway fatalities.

Key-words: Accident, Fatal, India, Railroad.

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INTRODUCTION

Indian Railway is the fourth largest railway worldwide, which provides the most economic and important mode of public transport in our country.¹ Efficient and safer transport infrastructure is vital for economic growth in developing countries.² The most common causes of unintentional injury are vehicular accidents.³ The accidental deaths are mostly due to the road traffic accidents but the deaths due to railroad fatalities are also significant, especially in the busy railway traffic zone. Recently there has been a succession of railway accidents in our nation, leading to depletion of a symbolic number of human lives.⁴ The fatality rate is

about 150 per 100 million passengers a year in India.⁵ Jaipur, being the capital of the state of Rajasthan is an important junction as regards to train traffic, condensed with highly populated regions including areas with congestion of road traffic too. Jaipur station alone deals with 88 Broad Gauge and 22 Meter Gauge trains and around 35,000 passengers in a day. It is the busiest railway station in Rajasthan.⁶ Most of the trains are overcrowded hence prone to meet with fatalities, despite of the efforts of railway and local body administrations. The increasing use of mobile phones and headsets, by the younger generation is responsible for incremental trends of

railway fatalities. Data pertaining to such events has never been reported in this region. Present Study was undertaken to evaluate the socio-demographic profile of railway fatalities.

MATERIAL & METHOD

Study design: Descriptive Observational Study.

Study setting: The study setting is the Department of Forensic Medicine and Toxicology, SMS Medical College and attached Hospitals, Jaipur in duration of May'2014 to November'2015.

Study subjects: All the cases of railway fatalities, irrespective of age, gender, socioeconomic status and subjected to medico-legal autopsy.

Inclusion criteria: All the autopsy cases of railway fatalities whose attendants gave their informed written consent.

Exclusion Criteria: All the autopsy cases of railway fatalities whose attendants did not give their informed written consent.

Study Tool: All the details pertaining to the profile of the deceased, precipitating event were noted along with the detailed recording of the external and internal findings during the post mortem examination. All the observations were recorded in the pre-tested Performa.

Data Collection: The investigator contacted the relatives of the deceased and informed about the purpose of the study and obtained informed written consent from them. The questionnaire included information on age, sex, marital status, residence, occupation, education, outcome (survival/death).

Analysis: Data were entered in MS excel sheet and descriptive statistical analysis was done.

Ethical clearance: It was obtained from the Institute Ethics Committee of SMS Medical College, and attached group of Hospitals, Jaipur.

RESULTS

During the study period, a total of 5828 medico-legal autopsies were performed amongst which 126 cases were those of railway deaths. Thus, the burden of railway fatalities in the Jaipur region during the study was 2.16 %. About 18% of the victims remained unknown till post-mortem examinations. Males were the predominant victims of railway related deaths, accounting for 91% of the total victims and female victims were only 8.7%. The majority of victims were between 21 to 40 years of age group.

Table 1: Age-Wise Distribution of Victims of Railway Fatalities (N=126)

Age Group (in years)	No. of cases	%
11 to 20	20	15.87
21 to 30	38	30.16
31 to 40	31	24.60
41 to 50	18	14.29
51 to 60	09	07.14
61 to 70	06	04.76
>70	04	03.17
Total	126	100.00

There was a rural preponderance of the study population with 48% victims and 34% victims belongs to urban regions. Half of the victims were married while unmarried and unknown study population shared about one-fourth proportion each.

Table 2: Distribution of the Railway Fatalities According To Literacy Status of Victims N=126

Literacy status	No. of cases	Percentage
Illiterate	09	7.14
Literate	92	73.02
Unknown	25	19.84
Total	126	100.00

Table 3 : Distribution of the Railway Fatalities according to Occupational Status of Victims

Occupation	No. of cases	Percentage
Students	42	33.33
Self employed	38	30.17
Agriculture	10	7.93
Housewife	06	4.77
Retired	04	3.17
Govt. sector	01	0.79
Unemployed	01	0.79
Unknown	24	19.05
Total	126	100.00

An almost equal number of railway fatalities occurred in summer and rainy seasons. Winter season witnessed the least number of railway related fatal incidences. The maximum numbers of railway fatalities were accidental in nature (67.46%) followed by suicides (27.78%). The majority of the fatal railway related incidences took place on the railway tracks (about 72%), followed by the railway crossings (about 21%). Least number of incidences occurred at the railway station or platform (07.15%). The victims of fatal railway related deaths mainly succumbed to hemorrhage & shock, injuries to vital organs and head injuries.

Table 4 : Distribution of the Railway Fatalities According to the Cause of Death N=126

Cause of Death	No. of cases	Percentage
Coma	34	26.98
Hemorrhage & Shock	46	36.50
Injury to Vital Organs	42	33.34
Septicemic Shock	04	3.18
Total	126	100

DISCUSSION

A total of 5828 medico-legal autopsies were conducted during the study period and the load of railway related deaths was found to be 2.16%, which is quite less as compared to other regions.

This is quite explainable as Jaipur is a metropolitan city with different police stations distributed to various Hospitals. Yet, the difference is statistically significantly lower when comparing these numbers with those of other studies conducted in different parts of the country as studies of Kumar A⁷ and Sheikh MI et al.⁸ The results of our study are slightly higher than those of Das G, et al.⁹ About 82% proportion of railway fatalities autopsied during the study period were identified and rest of 18% dead bodies remaining unidentified until the time of post-mortem examination. Data pertaining to this variable is not mentioned in the comparable literature from the adjoining parts of the country except the study of Sheikh MI et al.⁸ (59.54%), which are quite high as compared to our study.

More than 86% of the railway deaths were seen between 11 to 50 years of age. The peak occurred in the age group of 21-30 years. Similar results have been reported by other authors viz. Kumar A,⁷ Sheikh MI, et al.,⁸ Puttaswamy¹⁰ and Tyagi S, et al.¹¹ The peak has been reported in 31-40 years by Das G et al.⁹ and Wasnik RN.¹² No railway fatality was seen in children less than 16 years of age. Males predominated the study population (91%) outnumbering the females (8.73%). Similar observations have been reported by Das G et al.,⁹ Puttaswamy,¹⁰ Tyagi S, et al.,¹¹ Wasnik RN¹² and Pathak A et al.¹³ 50% of the study population were married and the marital status was undetermined for 23.02% people. These are expected results as the active age groups are quite beyond the minimum marriageable age. Our results are similar to study of Puttaswamy¹⁰ (65% married and 30% unmarried with 5% cases undetermined). About 48% victims of railway fatalities belonged to rural regions and 34% were from urban regions, which are quite variable for rural population as compared to Wasnik RN¹²

(70.52% urban and 29.48% rural population) probably due to variations in the cities of study and the population catered to by the tertiary care centers in both studies. But our results are in accordance with a study of Kumar A⁷ (62% rural, 2% urban and 35% undetermined).

Considering the study population according to their occupational status, surprisingly, there were 33.33% students and 30.17% self employed people among railway deaths. The factors which are responsible for higher incidences of railway fatalities in these sections of society are in the active phase of life and have to commute from one place to another for their profession and as the train is the cheapest mode of transportation in our country. Apart from this, these sections of the society are also the most vulnerable ones to stressful episodes in life, thus more prone to suicidal episodes in which railways are a preferred mode due to the high fatality. Sometimes, expression of heroism in youngsters compounded by use of psychoactive substances also potentiate the incidences of occurrence of accidental as well as suicidal deaths in them. The present study revealed that accidental fatality was the commonest manner (67.46%) followed by 27.78% suicidal deaths due to railway fatalities. Our results are similar to Kumar A,⁷ Tyagi S et al,¹¹ Wasnik RN¹² and Pathak A et al.¹³ None of the railway related death was found to be homicidal in the present study. It was observed that the railway fatalities occurred throughout the year without any uniformity and much seasonal variation except the cold season being less prone to them. But, in the present study, the majority of the incidences took place in the rainy season (41.27%) followed neck to neck by summers (40.48%), and lagging behind were the winters (18.25%). Our results are quite comparable to Wasnik RN¹² (34.68% in summers, 31.21% in rainy

and 34.1% in winter season). 72.22% fatal railway incidences took place on the railway tracks and the rest of them in regions near the track, 20.63% at railway crossings and 07.15% at railway stations.

Railway track is obviously the most vulnerable site for suicidal and accidental cases. People get suddenly entrapped by trains usually while crossing the tracks; especially with the development of railway locomotors which create less noise now-a-days. Moreover, the increasing use of mobile phones and earphones for talk and entertainment are also responsible for incremental trends in such incidences obscuring and masking the outside sound to the ears. Our results are similar to Das G et al⁹ (35.38% fatalities in railway track & 29.23% near the tracks). Our study concluded that none of the fatal cases in our study region has been reported related to derailments, collisions and fire accidents of the trains which are suggestive of improved railway safety levels. 73.8% cases in this study were spot deaths brought dead to the mortuary which is quite obvious owing to the high fatality of railway accidents. Our results are quite high in comparison to Sheikh MI et al⁸ (52%) and Tyagi S et al¹¹ (48%) brought dead cases. The higher proportion of suicidal cases in the present study is the probable reason behind this variation.

The most common cause of death in the present study was shock and hemorrhage (36.5%) either alone along with injuries to internal organs (33.34%) followed by cranio-cerebral injury (26.98%) due to blunt trauma from primary and secondary impacts. There were very few cases (3.18%) cases of death due to septicemia. Our results are in accordance with those of Sheikh MI et al,⁸ Das G et al,⁹ Wasnik RN¹² and Pathak A et al,¹³ but they are slightly variable to study of Tyagi S et al¹¹ who reported head injury

to be the commonest cause of death followed by shock and hemorrhage and injuries to internal organs.

CONCLUSION

The present study was an effort to analyze the spectrum of perpetuating factors leading to railway fatalities including human errors and mechanical failures. The main aim was to help ourselves and society in formulating preventive measures that could possibly avert railway fatalities. Most of the railway fatalities were accidental in nature and in bread earning age group with a male preponderance. The increasing population, overcrowding of trains, careless behavior of passengers, pedestrians & train drivers towards safety norms; along with increasing use of mobile and earphones are the constant causes of railway fatalities. This necessitates the need for attention towards accidental control measures. The railway authorities must take steps to prevent the accidents by acknowledging the safety engineering, training and awareness among staff, attentive surveillance, high quality maintenance and strict law enforcement. Public awareness about safety measures and existing law will also alleviate some of the fatalities. These can be prioritized towards vulnerable sections of the society by administration, social activists and non-governmental organizations. Our results demonstrate the importance of a comprehensive, sustainable railway injury surveillance system to promote safety engineering and law enforcement in a metropolitan rail system.

Recommendations:

- The railways must build sufficiently broad and strong foot bridges/subways for crossing the tracks and also close the crossing points, frequented by the pedestrians for crossing the tracks with

fencing, etc.

- Publically exhibiting warning notices and instilling awareness through media, educational institutions, NGOs for safety measures.
- Reduction of the distance between compartments and platforms, by raising the height of the platforms up to 840mm, the maximum limit.
- Adequate communication of the railway police station with all other polices stations of the country; especially sharing of the photographs of the missing persons through internet can help to identify the person.
- Trespassing takes place mainly on account of lack of barricading, fencing, absence of adequate number of pedestrian over bridges, reluctance to replace pedestrian level crossings with foot over bridges.
- Recommend railways for adopting an advanced signaling system based on continuous track circuiting and cab signaling.
- Recruitment of high level of vacancies in critical safety categories at railway health care units.
- Improvisation in passenger facilities such as sufficient number of platforms, narrow platforms, escalators and elevators for physically challenged.
- Rescue and relief operations for saving lives in railway accidents and casualties are to be included in the scope of the railway safety guidelines.

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