

Original Research Article

Analysis of railway track deaths-an autopsy based study

Valsala K.¹, C. S. Sreedevi², Sreelekshmi J.^{2*}

¹Department of Forensic Medicine, Government Medical College, Trivandrum, Kerala, India

²Department of Forensic Medicine, Government T. D. Medical College, Alappuzha, Kerala, India

Received: 21 December 2016

Accepted: 28 January 2017

*Correspondence:

Dr. Sreelekshmi J.,

E-mail: jsreelekshmi@gmail.com

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ABSTRACT

Background: Railway related deaths account for approximately one percentage of all fatalities submitted to medicolegal autopsies. The study is undertaken with the aim of better understanding of railway track deaths by analyzing the demographic details of victims and other contributing factors which favours the occurrence of railway track deaths.

Methods: A cross sectional descriptive study of all railway track deaths brought for medicolegal autopsy at Thiruvananthapuram Medical College, Kerala, India from 1st March 2010 to 28th February 2011 was done. A total of 104 cases of railway track deaths were studied excluding cases with advanced decomposition. Clinical case records were studied in treated cases. details regarding nature dimensions and location of injury was entered in a proforma. The data were entered in MS Excel and statistical analysis was done.

Results: Out of 104 cases studied 83 (79.8%) victims were male and 21 (20.2%) victims were female. The lowest and highest age of the victim involved in the study was 15 years and 90 years respectively. Elderly people with impairment of vision and hearing are most vulnerable to such accidents 12.5%. The highest frequency of incidence of railway deaths occurred while crossing the Railway track (32.7%), followed by jumping in front of the train (19.2%) and walking along the side or through track (16.3%). In 17.3% of the cases there was no exact history regarding the incident. The most common types of external injuries were lacerated wound and abrasion. In all the cases head showed lacerated wounds and the upper limbs showed abrasion.

Conclusions: Present study concludes that majority of victims were males showing a female ratio 4:1, The peak incidence was noted in the 6th decade. Most of the victims were manual labourers. Travelling, moving and crossing near railway tracks in intoxicated condition is very usual practice. Survival period was found to be very less.

Keywords: Demography, Fatal train injuries, Railway accidents

INTRODUCTION

With ever increasing mechanization vehicular accidents are steadily increasing in magnitude and frequency. Being a huge system of transportation railway is an agent causing accidents during operations and any type of trauma may be seen in this.

Indian Railway is a largest railway system in the world under a single management. Railway accidents occupied

an important role in the medical and legal disclosures on trauma and traumatic disorders.¹ In India most of the railway tracks run to populated areas and being the cheapest mode of transportation, most trains travel thickly packed. All these factors increase the possibilities of accidents.² The Railway also provides a convenient mode of suicides and many cases have been reported were a person being deliberately lie across the railway line or even place his head on the line in order to achieve self-destruction.³

Railway related deaths account for approximately one percentage of all fatalities submitted to medicolegal autopsies. The purpose of all accident investigations is to establish the cause of incidents. Regulatory authorities may fix the responsibility and safety authorities will want to see what can be done to prevent recurrence.⁴ The study is undertaken with the aim of better understanding of railway track deaths and also the pattern of injuries caused in different situations.

Aims and objectives

To study the demographic features, and distribution of different contributing causes among the victims of railway track deaths.

METHODS

A cross sectional descriptive study of all railway track deaths brought for medicolegal autopsy at Thiruvananthapuram Medical College, Kerala, India from 1st March 2010 to 28th February 2011 was done. A total of 104 cases of railway track deaths were studied excluding cases with advanced decomposition. Data regarding age, sex, nature of incidents and its possible the manner survival period etc., are collected from the Kerala Police Form 102 (KPF 102), investigating officers and relatives. Clinical case records were studied in treated cases. A meticulous external and internal examinations was made and the details regarding nature dimensions and location of injury was entered in a proforma. The data were entered in MS Excel and statistical analysis was done. The qualitative data is represented using frequency and proportions.

RESULTS

Out of 104 cases studied 83 (79.8%) victims were male and 21 (20.2%) victims were female. The age group most commonly involved was 6th decade (17.6%) closely followed by 3rd and 7th decade (16.7% each) (Figure 1).

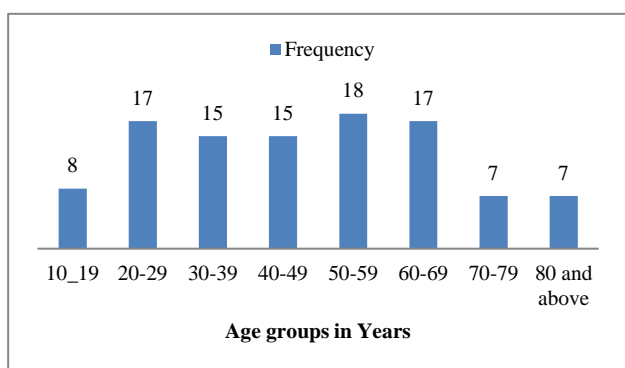


Figure 1: Distribution of cases according to age.

The lowest and highest age of the victim involved in the study was 15 years and 90 years respectively. Most of the victims showed an educational status of high school level

(47.3%) (Table 1). The identity of 13 victims included in the study was unknown. Out of the 104 victims 25.9% were manual labourers, 15.3 % were unemployed, 10.5% were dependent persons, 6.7% were students, and 1.8% were professionals like doctors and engineers (Table 2).

Table 1: Distribution of educational status of the victims.

| Education | Frequency | Percentage |
|--------------------------|-----------|------------|
| Illiterate | 7 | 7.7 |
| Primary | 20 | 22.0 |
| High school | 43 | 47.3 |
| 10+2 | 10 | 11.0 |
| Degree | 7 | 7.7 |
| Post Graduate/Profession | 4 | 4.4 |
| Total | 91 | 100.0 |

Table 2: Distribution of cases according to occupation.

| Occupation | Frequency | Percentage |
|------------------------|-----------|------------|
| Student | 7 | 6.7 |
| Dependent | 11 | 10.5 |
| Unemployed | 16 | 15.3 |
| House maid | 1 | 0.9 |
| Manual labourer | 27 | 25.9 |
| Vegetable vendor | 1 | 0.9 |
| Farmer | 1 | 0.9 |
| Petty shop owner | 4 | 3.8 |
| Business | 2 | 1.9 |
| Skilled worker | 8 | 7.6 |
| Retired employee | 5 | 4.8 |
| Employed | 4 | 3.8 |
| CRPF constable trainee | 1 | 0.9 |
| Lecturer | 1 | 0.9 |
| Engineer | 1 | 0.9 |
| Doctor | 1 | 0.9 |
| Unknown | 13 | 12.5 |

Victims belong to the urban areas constituted 66.3% and rest were from rural areas. Majority of the victims were trespassers 87 (83.7%), 8 (7.6%) victims were passengers, 4 (3.8%) were pedestrians, 2 (1.9%) were railway staffs and 3 (2.8%) were occupants of motor vehicles (Table 3).

Table 3: Distribution of cases according to type of victim.

| Type of victim | Frequency | Percent |
|---------------------------|-----------|---------|
| Railway staff | 2 | 1.9 |
| Passenger | 8 | 7.6 |
| Pedestrian | 4 | 3.8 |
| Trespasser | 87 | 83.7 |
| Occupant of motor vehicle | 3 | 2.8 |
| Total | 104 | 100.0 |

The occurrences were maximum on weekends constituting 58 (55.7%) cases (Figure 2). Most of the

incidents 24 (23.1%) were happening in the early hours of the day between 6AM to 9AM and was gradually decreasing till midnight to 3AM (Figure 3).

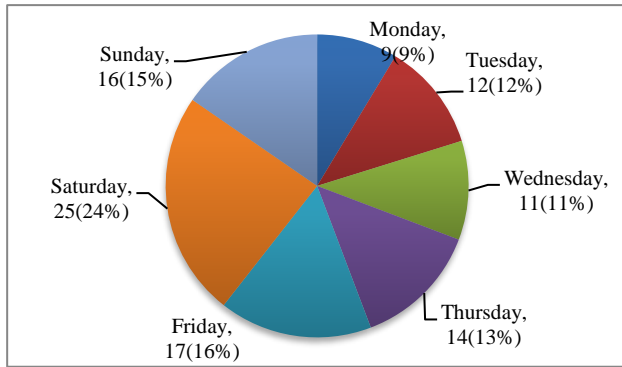


Figure 2: Distribution of cases according to day of incident.

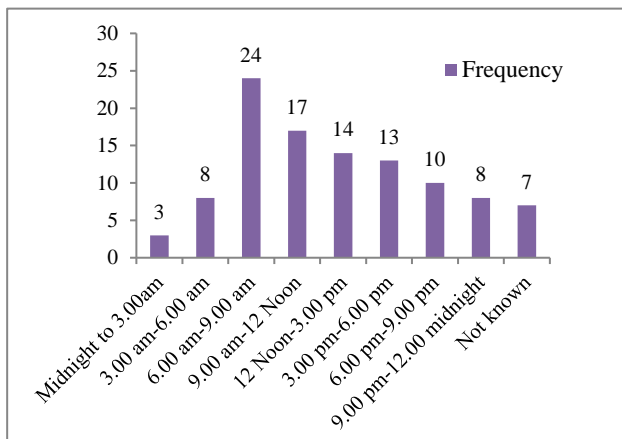


Figure 3: Distribution of cases according to time of incident.

The victims under the influence of alcohol constituted 48.4%, 12.5% were habituated to smoking, pan chewing or using other addictive drugs in addition to alcohol. The rest 51.6 % were non-alcoholic. Elderly people with impairment of vision and hearing are most vulnerable to such accidents 12.5%. Victims with history of psychiatric illness constituted 6.7%. One person was epileptic and two other were having senile dementia (Table 4).

Table 4: Distribution of cases according to contributing factors.

| Contributing factors | Frequency | Percent |
|----------------------|-----------|---------|
| Vision impairment | 6 | 5.8 |
| Hearing impairment | 7 | 6.7 |
| Psychiatric illness | 7 | 6.7 |
| Diabetes mellitus | 1 | 0.9 |
| Epilepsy | 1 | 0.9 |
| Senile dementia | 2 | 1.9 |
| No known factors | 80 | 76.9 |
| Total | 104 | 100.0 |

In majority of cases (70%) the cause of death was multiple injuries. Head injury constituted 12.5%, 9.6% was decapitation injury, 3.8% was injury to chest and abdomen, 3.1% to chest and pelvis, and 1% included injury to neck structures. Majority of the cases (95%) were found dead at the scene. 4.8% of cases were brought for treatment to hospital and the period of survival ranged from two hours to 11 days (Table 5).

Table 5: Period of survival of the railway accident victims.

| Period of survival | No. of cases | Percentage |
|--------------------|--------------|------------|
| 2 hours | 1 | 20 |
| 3 hours | 2 | 40 |
| 2 days | 1 | 20 |
| 11 days | 1 | 20 |

Table 6: Distribution of cases according to type of incident.

| Type of incident | Frequency | Percent |
|--|-----------|---------|
| Fall from running train | 6 | 5.8 |
| Walking along the side of or through the track | 17 | 16.3 |
| While crossing the track | 34 | 32.7 |
| Lying across the track | 6 | 5.8 |
| Jumping in front of the train | 20 | 19.2 |
| Due to collision of motor vehicle and train | 3 | 2.9 |
| No exact history | 18 | 17.3 |
| Total | 104 | 100.0 |

The highest frequency of incidence of railway deaths occurred while crossing the Railway track (32.7%), followed by jumping in front of the train (19.2%) and walking along the side or through track (16.3%). In 17.3% of the cases there was no exact history regarding the incident (Figure).

Table 7: Distribution of cases according to condition of body.

| State of body | Frequency | Percentage |
|---------------|-----------|------------|
| Injured | 65 | 62.5 |
| Mutilated | 20 | 19.2 |
| Mangled | 19 | 18.2 |
| Total | 104 | 100 |

In 77.9% of cases express trains were involved. Body as a whole with injuries were brought in majority of cases 65 (62.5%), where as in 19.2% of cases the body was mutilated and in 18.2% it was in a mangled state. Grease stain was present in 85.6% cases. External injury was present in all the cases. The most common types of external injuries were lacerated wound and abrasion. In all the cases head showed lacerated wounds and the upper limbs showed abrasion. All the cases showed soft tissue injuries of the head and face. Fracture of the skull bone

was present in 66.6% of cases. None of the cases showed facial bone fracture. In only one case the neck showed soft tissue injury (abrasion) and one case showed cervical spine fracture.

DISCUSSION

In this study, the proportion of males was more compared to females with a ratio of 4:1, which agrees with the study done by Sahoo and Kar in 1998.⁵ The male predominance over female was since most of the outstation activities are usually carried out by the males. The age group which showed a higher frequency was 6th decade of life and this disagrees with the study done in northern part of Kerala,⁶ which showed the preponderant age group of 4th decade.⁶ The age group of 3rd decade, most of the cases, could be due to dangerous travel and careless crossing and in 7th decade due to the physical incapacity of old age. In the present study, the period of survival of the victim was found to be very less, ranging from 2 hours to 11 days. In the study by Agalar Et Al the mortality rate was very high as the human body is subjected to very high velocity hit.⁷ Victims belong to the urban areas constituted 66.3% and rest were from rural areas which agrees with the study done in Central India.⁸

The majority of cases may be accidents followed by suicide which agrees with Mohanty et al.⁹ Out of 104 cases there was definite history of suicide in 26 (25%) cases and no exact history was there in 18 cases. Most of the victims showed an educational status of high school level (47.3%). Higher number of victims were manual labourers (25.9%). In 48.4% there is evidence of alcohol consumption and in 51.6%, the victims were non-alcoholics. Victims were also habituated to smoking (12.5%), chewing pan or using other addictive drugs. Persons travelling in train, moving and crossing near railway tracks in intoxicated condition is a very usual practice and account for significant number of (48.4%) in the study. This explains why stringent actions are made by the central government regarding drunkenness.¹⁰

There were other contributing factors like vision and hearing impairment in 12.5% cases. Most of them were elders. Hence in medicolegal autopsy all cases the body has to be examined for the signs of intoxication and natural disease which agrees with Umadathan.¹¹ In 5 (6.7%) of victims there was history of psychiatric illness which is one of the pre-disposing factors in suicides. Among them, 5 cases (4.8%) presented with history of jumping in front of train and other two (1.9%) with lying across railway track. Both histories were suggestive of suicidal attempts. This agrees with the study done by Cheng ATA12 Most of the occurrences were on the weekends involving Saturdays (24%) The incidence took place between 6AM to 9AM, when people are busy in the morning hours to reach their workplace could be the reason for higher incidence. Electrocution or death by burns or drowning in lake or river (if train falls of a bridge) etc. can also occur in train accidents according to

V V pillai.¹³ In the present study no case with electrical injury was brought for autopsy, even though the railway lines are electrified in Kerala.

CONCLUSION

In the present study majority of victims were males to female ratio 4:1, The peak incidence was noted in the 6th decade. Majority of cases belonged to urban areas. Most of the victims were manual laborer's. Travelling, moving and crossing near railway tracks in intoxicated condition is very usual practice. Most of the victims had educational status upto high school level. Survival period was found to be very less. Most of the occurrences were on the weekends and early hours of the day, between 6AM to 9AM. Disease and disability contributes to the risk of railway occurrence.

ACKNOWLEDGEMENTS

Authors extend their sincere gratitude to Dr. P. Rema (Professor & Head of The Department of Forensic Medicine, Trivandrum) and all other teachers & faculties of Trivandrum medical college for the guidance, valuable and inspiring sense of communications and interactions in this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Valsala K, Sreedevi CS, Sreelekshmi J. Analysis of railway track deaths-an autopsy based study. *Int J Res Med Sci* 2017;5:935-9.