

# A Comprehensive Study of Deaths due to Railway Accidents Reported at a Tertiary Care Hospital Mortuary during the Period of January to December 2015

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## ABSTRACT

**Introduction:** Cities are locations having a high level of accumulation and concentration of economic activities and are complex spatial structures that are supported by transport systems. The evolution of mass rapid transport system in the form of sub-urban railway network has increased railway casualties in the cities as the railroads pass through residential and commercial zones. Hence, the aim of the present study was to assess the analysis of death due to railway accidents in a tertiary care hospital.

**Material and Methods:** During the study period, total 5240 autopsies were conducted in Osmania General Hospital Mortuary, out of which 474 were due to railway accidents. All the findings of autopsy report were noted and relevant photos at the time of autopsy were taken. In relevant cases, wherever necessary the organ were collected and was sent for histopathological examination. Autopsy on all cases of deaths due to railway accidents conducted at Mortuary, Osmania General Hospital in 2015 were included in the present study.

**Results:** Maximum fatalities were reported among third decade of life i.e. 31-40 years followed by second and fourth decade i.e. 21-30 years. Lowest number of fatalities was reported from eighth and first decade of life i.e. 81-90 years. In accidental cases cause of death in most of the cases is multiple injuries, followed by head injury and head injury associated with other injuries.

**Conclusion:** Highest number of accidents happened while crossing the railway track, followed by people lying on the track or jumping in front of a moving train. In suicidal deaths most of the cases were due to decapitation, followed by crush injuries. About 7 cases of traumatic transection were reported during the period of study.

**Keywords:** Railway Accidents, Autopsies, Suicidal, Retrospective

in India, where the locomotive was once considered as a “fire-spitting demon”. It is one of the world’s largest railway networks comprising over 1, 15,000 km of track over 7,100 stations. In 2013–14, Indian Railways carried 8.425 billion passengers which are over 23 million passengers every day.<sup>3</sup> In 1956, WHO advisory group defined accident as unpremeditated event resulting in recognisable damage occurrence in a sequence of events which usually produce unintended injury, death or property damage. Accidents are the ninth common cause of death in India.<sup>1</sup> Though most of the fatalities in India are road traffic accidents, the railway accidents are not negligible particularly in urban and suburban railway zones.<sup>4</sup>

A train accident is defined as a “collision, derailment, or any other event involving the operation of on-track equipment”. Fortunately, train accidents (first category) do not happen very often, but when they do, they can be extremely catastrophic. Due to their weight, mass and force anything in a train path is in grave danger. The second category (movement accidents) has been taken up for the study as the number of fatalities cumulatively are far more than those from the other two categories combined and further challenges faced by forensic experts.<sup>5</sup>

The review of train accidents of the last 5 years (2009-10 to 2013-14) for which the data is available indicates that a large number of accidents happen because of derailments and at level crossing. It is also clear that more than 80% of the accidents are caused by Human Failure (Railway Staff or Otherwise). The good sign however is that the number of accidents per million kilometres run and number of casualties per million passengers carried has come down in the last few years.<sup>6,7</sup>

Cities are locations having a high level of accumulation and concentration of economic activities and are complex

## INTRODUCTION

Indian Railways, which had a modest beginning in 1853, has since then been an integral part of the nation -- a network that has held together a population of one billion. A self-propelled social welfare system that has become the lifeline of a nation, Indian Railways has woven a sub-continent together and brought to life the concept of a united India. If it was trade of wool that prompted the journey of the first ever passenger train in England between Stockton and Darlington in 1825, it was trade of cotton, among other things, that prompted the journey of the first ever train on the Indian sub-continent.<sup>1,2</sup> Railways were used by the British to consolidate their grip on the country. Slowly railway communication gained foothold

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spatial structures that are supported by transport systems. The evolution of mass rapid transport system in the form of sub-urban railway network has increased railway casualties in the cities as the railroads pass through residential and commercial zones. Same is the case of Hyderabad, a metropolitan with a population of more than 7 million.<sup>8</sup> Hyderabad is in the midst of a very well developed railway network and is well connected with trains to every corner of the country. Two major stations in the city are Hyderabad Deccan railway station (popularly known as Nampally railway station) and Kachiguda railway station, both built by Nizam of erstwhile Hyderabad state in 1874 and 1916 respectively. Both stations have heavy traffic of not only passenger trains but also freight carriers. The number of fatalities is increasing year after year in Hyderabad due urbanization and population explosion.<sup>9</sup>

Most of the cases of railway deaths that were reported are either hit by the moving train or found in the surroundings of the railway track. The problem for investigating officer and medico legal expert starts with identification as most of the reported cases are unknown and are in mutilated and badly mauled condition. And the challenge doubles up for the forensic expert if there are signs or suspicion of killing the person somewhere else and keeping the body on railway track so that the injuries may be concealed. But most of the railway fatalities are suicide or accidents. During autopsy, railway pattern of injuries should be differentiated from other injuries and ante-mortem from post-mortem.<sup>10</sup>

Hence, the aim of the present study was to analyse all the cases brought to Osmania General Hospital Mortuary. This study has been used to derive epidemiological data in railway accidents, analytical study of the injuries that caused death and manner of death.

## MATERIAL AND METHODS

The present study was a retrospective study in which cases were selected and brought to Osmania General Hospital Mortuary, Hyderabad during the entire year of 2015 i.e. 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015. The present study was conducted among 475 cases in Department of Forensic Medicine, Hyderabad. These cases were accident cases which were brought from both railway police station Hyderabad and railway police station Kacheguda.

The initial data regarding identity of the person, where, when and by whom was the body first found, last seen alive, position of the body, clothes stains and injuries on the body was collected from inquest reports. Photographs of the crime scene and the deceased were collected. Newspaper publications about the incident were collected. In the case of hospital death, case sheet was collected.

Detailed history was collected from friends and relatives where ever possible about the emotional status, psychiatric conditions, addictions to alcohol or any other drugs, any physical disabilities and about socio-economic condition. All the findings of autopsy report were noted and relevant photos at the time of autopsy were taken. In relevant cases, wherever necessary the organ were collected and was sent

for histopathological examination.

Autopsy on all cases of deaths due to railway accidents conducted at Mortuary, Osmania General Hospital in 2015 were included in the present study. In relevant cases, where alcohol intoxication or poisoning was suspected, viscera was collected and sent for toxicological analysis. The preservative used is saturated solution of sodium chloride. The collected samples were sent to forensic science laboratory for further analysis and final opinion was drafted after receiving the toxicological report from the Forensic Science Laboratory. The specimens collected were stomach and its contents, 500 gm. of liver followed by half of each kidney and blood 10cc

### The brief description of cases is as follows:

A 34 years married female was found dead at 04:45 pm on 09/10/2015 between Fateh nagar- Sanath nagar railway stations near KM no: 176/20-22 in between the tracks. The dead body was brought by Railway Police of RPS Hyderabad for post mortem and upon investigation it was found out that the woman has committed suicide.

The cause of death was traumatic decapitation of the head at the level of C4 of cervical spine with comminuted fracture of all facial bones, vault which shows a fissured fracture vertically and base of the skull with a cross-section of 14x10cms and with loss of brain matter and present separate from the body.

A 56 years old male railway employee was found dead at 09:25 AM on 11/02/15 between Borabanda and Hitech city railway stations while performing his duties. The body was found near the track and after investigation the manner of death was found to be accidental. The death was due to choking and head injury associated with left ventricular hypertrophy.

A 42 years old female was alighting the train at Nekkonda village on the side opposite to that of platform due to heavy rush on the platform. While getting down, the train suddenly started to move and she fell down accidentally and her both legs were cut off by the wheels of the train. She was admitted in the local hospital and later shifted to Osmania general hospital where she expired on 18<sup>th</sup> February. The death was due to traumatic amputation of both lower limbs and its complications.

An unknown male person of approximate age about 65 years was walking along the track on 11/03/15 before 11:45pm near Umda Nagar railway station, when an unknown train hit him. He was admitted to Osmania General Hospital and later expired on 18/03/2015. The reason for his death was due to septicaemia consequent to multiple injuries.

A 21year old male was found dead on 15/04/15 before 09:50AM between Vidyanagar and Kacheguda Railway stations near the downside track. During the course of investigation, it was found out that he fell from a moving train accidentally. The reason for his death was multiple injuries.

An unknown female of 50-55years on 23/05/2015 at around 05:00 PM and between Kacheguda – Malakpet railway stations was hit by MMTS Train no: 47201 while trespassing and died on the spot near the upline railway track. The reason

of her death was multiple injuries.

## RESULTS

During the study period, total 5240 autopsies were conducted

Age Group	Number of Autopsies
0-10	4
11-20	22
21-30	112
31-40	120
41-50	97
51-60	75
61-70	33
71-80	9
81-90	2
Total	474

**Table-1:** Shows the distribution of data based on age group among the study subjects

Gender	Number Fatalities
Female	63
Male	411
Total	474

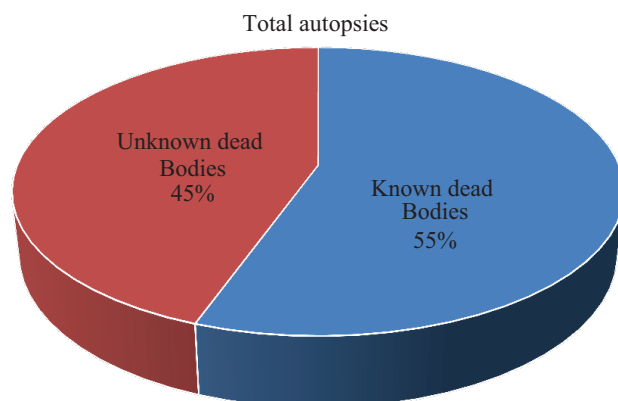
**Table-2:** Shows the distribution of data based on gender among the study subjects

Time of Accident	Number of Fatalities
6 PM – 6 AM	238
6 AM – 12 PM	132
12 PM – 6 PM	104
Total	274

**Table-3:** Shows the distribution of data based on time of accident among the study subjects

Manner of Death	Number of Fatalities
Accident	300
Suicide	124
Homicide	1
Natural	49
Total	474

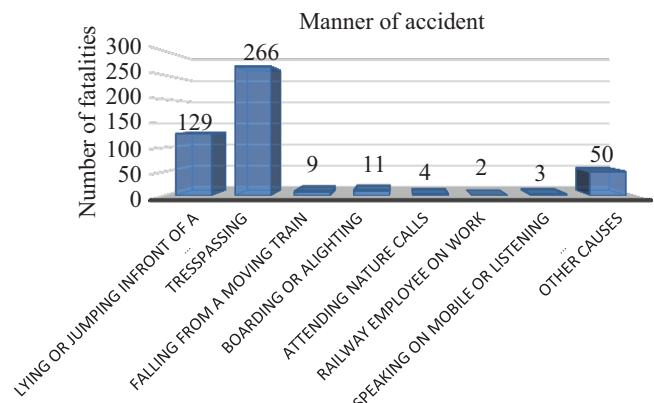
**Table-4:** Shows the distribution of data based on manner of death among the study subjects



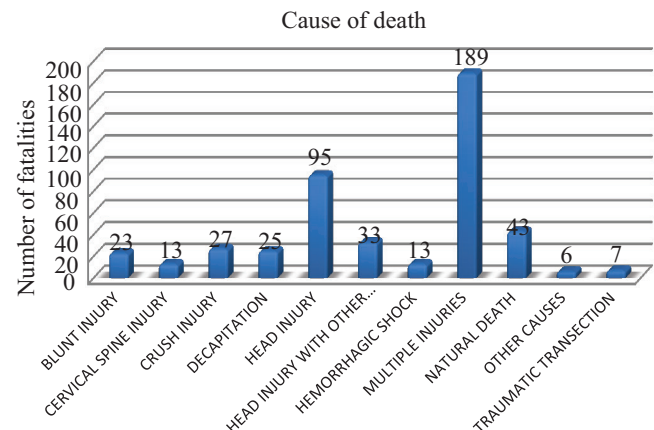
**Graph-1:** Shows the distribution of data based on total number of autopsies among the study subjects

in Osmania General Hospital Mortuary, out of which 474 were due to railway accidents. Among those 474 autopsies 225 were brought by railway police station Kacheguda, 244 by railway police station Hyderabad and one each from railway police station Secunderabad, railway police station Warangal, railway police station Mahabubnagar and two from railway police station Nalgonda.

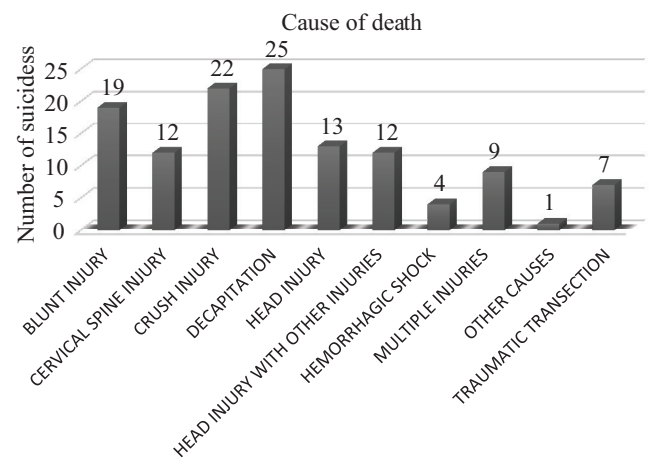
Maximum fatalities were reported among third decade of life i.e. 31-40 years followed by second and fourth decade i.e. 21-30 years. Lowest number of fatalities was reported



**Graph-2:** Shows the distribution of data based on manner of accident among the study subjects

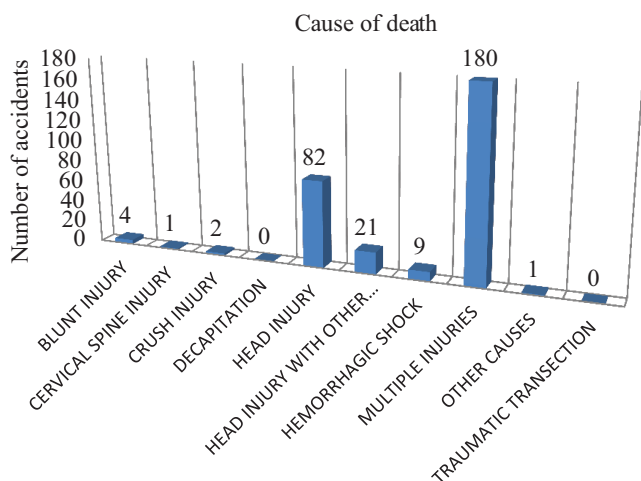


**Graph-3:** Shows the distribution of data based on the cause of death in railway fatalities among the study subjects



**Graph-4:** Shows the distribution of data based on the cause of death in suicides among the study subjects





**Graph-5:** Shows the distribution of data based on the cause of death in accidents among the study subjects

from eighth and first decade of life i.e. 81-90 years (Table 1) Female fatalities accounted for only 13% of the autopsies in the study period. This shows that male fatalities are much more common as they outweigh female fatalities 6.5: 1. Out of 474 cases, 411 were males and 63 were females (Table 2). Accidents that occur during night time are usually not reported in the night instead those accidents are first noticed the early hours of next day. That is why time interval of 12 hours is taken during the night time and incidentally most number of fatalities are reported in that period followed by 6 hour interval from early morning to mid-day. And least number was reported during the 6 hour interval from mid-day to evening (Table 3).

Majority of the cases are accidental (300) amounting to 63% of fatalities. About 124 cases of suicides are reported constituting 26% and 49 cases of natural cases were reported. Only one cases of homicide was reported. Most number of accidents happened accidentally while crossing the track, followed by people lying on the track or jumping in front of a moving train to commit suicide. Two cases were reported of railway employees on work during the study period (Table 4).

Total 474 autopsies conducted out of which 263 cases were of known persons and 211 were unknown dead bodies. It was found that 45% of the railway fatalities are unknown cases and known bodies were 55% (Graph 1). Most number of accidents happened accidentally while crossing the track, followed by people lying on the track or jumping in front of a moving train to commit suicide. Two cases were reported of railway employees on work during the study period (Graph 2).

The maximum number of cases died due to multiple injuries followed by head injury in railway fatalities. Also, the cause of death in accidents was found to be due to multiple injury and head injury. But the cause of death in suicide is due to decapitation followed by crush injury and blunt injury (Graph no 3, 4 and 5).

#### Discussion

During the year of 2015 the railway fatalities that were

brought to Osmania General Hospital mortuary were taken up for the study. All the fatalities in the jurisdictions of Railway Police station Hyderabad and Railway Police station Kacheguda were brought to Osmania mortuary. Among the railway fatalities, out of a total of 474 cases 263 cases were of known persons and 211 were of unknown persons.

There were higher number of unknown cases that were reported due to multiple factors like extreme mutilation of the body making it highly difficult even for the immediate family members to recognise the dead body, early decomposition changes due to multiple injuries and lack of efficient procedure with the police personnel to trace out the unknown. In some cases, people travel to the city from far off places and travel alone and when they met with accident it would be very hard for the police personnel to trace out the victim.

The commonest indication for coroner's autopsy in this study was SUND which accounted for 65.5% of all cases. These findings are at variance with Aligbe et al where he reported 2 year prospective study of coroner's autopsy done between 1996 and 1997 which found unnatural deaths (accidents, homicides, and suicides) to be the commonest indication for medico legal autopsies. In that study, accidents, homicides, and suicides together accounted for 66.8% of medico legal autopsies.<sup>11</sup>

Out of 474 cases of railway fatalities 120 cases were in the age group 31-40 years and 112 cases were in the age group 21-30 years. As this is primarily the age group of the working class and daily labourers who go out into the city to earn their livelihood, they are the ones who met with a railway accident. Death of the person in that age is extremely difficult to cope up for the family as in most of the cases that person would be the primary bread winner in that family. Death of a person in that age group is a loss not only to the family but also to the country as the work force contributing to the growth of the economy is lost.<sup>12</sup>

Total number of males in railway fatalities during the study period is 411(87%) and the number of females during the same period is 63(13%). Males clearly outnumber the females in both accidents and suicides. Most of the deaths due to railway accidents are in males probably due to the nature of the work that requires frequent crossing of the track or the travelling they do for household and personal works. This result was in concordance with the studies conducted by Ibadan and Port Harcourt et al where the male preponderance, with a male to female ratio was found to be 1.9:1.<sup>13,14</sup>

In a study conducted by Odesamni and Akhiwu et al, few cases of suicide were observed accounting for 0.5% of coroners autopsies performed. The rate of suicide in this study is similar to findings from other studies in Nigeria. The author reported relatively high suicide rates of 4% and 1.8%, respectively. Higher rates are reported in more advanced countries as observed in the studies conducted by Thompson et al.<sup>15,16,17</sup>

Manner of accident in railway fatalities during the study period has shown that the most number of accidents happened while crossing the railway track carelessly. Even

though the people trespassing the track are prosecuted and fines being collected from them people seldom use the over bridge and under pass to cross the track, especially near the platforms where they have to change lines to catch another train. People are in such a hurry that they seriously misjudge the speed of the train and eventually take them out of the world instead of taking them to their destination.

## CONCLUSION

Most number of deaths was reported among the subjects in their 4<sup>th</sup> decade of life. Most number of death occurred among males in comparison to females. In most of the cases, death occurred on the spot. In accidental cases cause of death in most of the cases is multiple injuries, followed by head injury and head injury associated with other injuries. Hence, railway fatalities can pose great challenges to the medico legal expert and investigating officer if they are investigated properly and autopsies conducted by observing everything carefully.

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