

Comprehensive Analysis of pattern of deaths due to train traffic accidents in Chennai

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Abstract

Background: Railways being one of the commonest modes of transportation also have a risk of accidents associated to it². 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. **Aim:** The present study is to assess the analysis of death due to railway accidents. **Material and Methods:** In our study all railway accident deaths were studied for a period of (1) Year in the Year 2020 from 01-01-2020 to 31-12-2020. Out of 2719 Post – Mortem Examinations conducted in that year 58 deaths were found to deaths related to train traffic accidents which constitute (2.13%) of the total deaths. **Results:** The results shows Maximum cases of deaths due to train traffic accidents were seen in males (86.20%). Maximum deaths were seen in the age group of 31- 40 Years (37.93%). Maximum cases of deaths occurred in the morning hours between (6.00 A.M – 12.00 P.M) which is 67.24%. Maximum cases of deaths were due to Trespassing (46.55%). Maximum cases were brought dead to our hospital (96.55%). Maximum abrasions were seen over the head (41.37%). Maximum contusions were seen over the chest (37.93%). Maximum Lacerations were seen over the lower limb (25.86%). Maximum fractures were seen over the lower limbs (36.20%) The cause of death in maximum cases was head injury (18.96 %). Maximum cases were suicidal deaths (68.96%) followed by accidental (31.03%).

Key Words: Train Accidents, Autopsy, Gross Mutilation, Suicidal.

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INTRODUCTION

Indian railways, which had a modest beginning in the year 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, and among other things that prompted the journey of the first ever train on the Indian Sub –Continent. Railways were used by the British to consolidate their grip on the country. Slowly railway communication gained foothold 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 tract over 7,100 stations. Indian Railways carry approximately 8.425 billion passengers which are over 23 million passenger’s everyday Indian railways are the most complex well managed railway system in the world with the available resources¹. Being the cheapest mode of transportation, most trains travel thickly packed, thus increasing the chances of accidents. Railway related deaths mostly occur when the tracks are used as a convenient route for walking. Other causes of death may

be a collision between two trains, an automobile and train collision, a passenger falling out of the compartment door. Railways are also considered as a convenient method of suicide.² 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. Though most of the fatalities in India are road traffic accidents, the railway accidents are not negligible particularly in urban and suburban railway zones.¹ 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. A vast variety of injuries are caused due to railway accidents which are often difficult to assess during Post – Mortem Examination. 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.¹ The problem for investigating officer and Medico Legal Experts starts with identification as most of the reported cases are unknown and are in mutilated and badly mauled condition¹. 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 the other injuries and Ante-Mortem from Post – Mortem². Thus special observations are required in case of presence of certain features such as wheel marks on the body, dirt and grease contamination and the manner of injuries to rule out criminal violence².

AIM OF THE STUDY

This study has been used to derive epidemiological data in railway accidents, analytical study of the injuries that caused death and possible manner of death.

MATERIALS AND METHODS

The present study is a prospective study in which deaths due to train traffic accident which has come with a requisition to the Department of Forensic Medicine and Toxicology attached to Government Kilpauk Medical College and Hospital, Chennai -10, Tamil Nadu in the year 2020 from 01-01-2020 to 31-12-2020 were taken into consideration. A proforma was prepared such as sex, age, time of occurrence, cause of accident, duration of survival, pattern of injuries, cause of death and manner of death. It was then interpreted statistically with tables and bar diagrams.

INCLUSION CRITERIA

All cases of deaths due to Train Traffic Accidents that have come with requisition for Post – Mortem Examination to Government Kilpauk Medical College and Hospital, Chennai -10 from 01-01-2020 to 31-12-2020.

EXCLUSION CRITERIA

Decomposed and skeletonised dead bodies were excluded out from our study.

OBSERVATIONS:

TABLE 1: SEX WISE DISTRIBUTION

SEX	FREQUENCY	PERCENTAGE %
MALE	50	86.20
FEMALE	08	13.79
TOTAL	58	100

Maximum cases of deaths due to train traffic accidents were seen in **males (86.20%)**

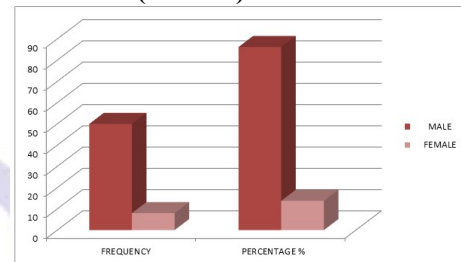


Figure 1:

TABLE 2: AGE WISE DISTRIBUTION

AGE (IN YEARS)	FREQUENCY	PERCENTAGE %
BIRTH TO 10	02	3.44
11-20	01	1.72
21-30	07	12.06
31-40	22	37.93
41-50	16	27.58
51-60	06	10.34
61-70	03	5.17
71-80	01	1.72
TOTAL	58	100

Maximum deaths were seen in the age group of **31- 40 Years (37.93%)** followed by **41-50 Years (27.58%)**.

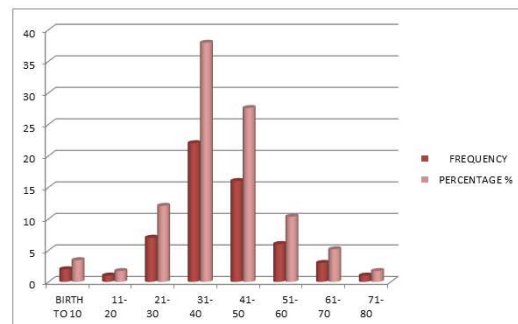


Figure 2

TABLE 3: TIME OF OCCURENCE

TIME	FREQUENCY	PERCENTAGE %
6.00 A.M TO 12 P.M	39	67.24
12.01 PM TO 6.00 P.M	06	10.34
6.01 P.M TO 11.59 P.M	13	22.41
TOTAL	58	100

Maximum cases of deaths occurred in the **morning hours between (6.00 A.M – 12.00 P.M)** which is **67.24%** followed by **evening hours between (6.01 P.M TO 11.59 P.M)** which is **22.41%**.

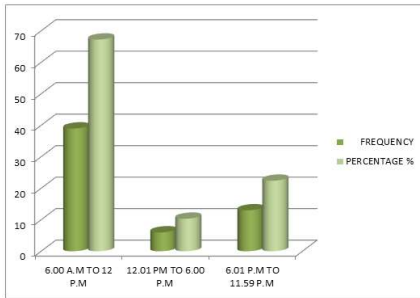


Figure 3

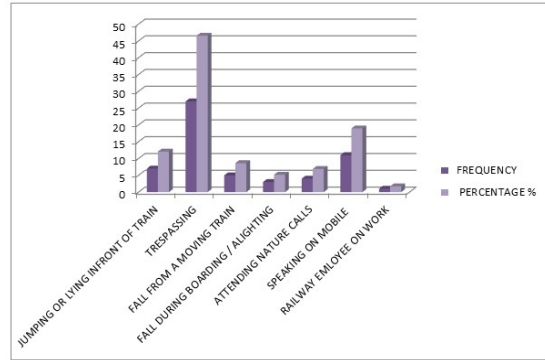


Figure 4

TABLE 5: DURATION OF SURVIVAL / BROUGHT DEAD

BROUGHT DEAD / SURVIVAL	FREQUENCY	PERCENTAGE %
BROUGHT DEAD	56	96.55
SURVIVAL UPTO 24 HOURS	02	3.44
TOTAL	58	100

Maximum cases were **brought dead to our hospital (96.55%)**.

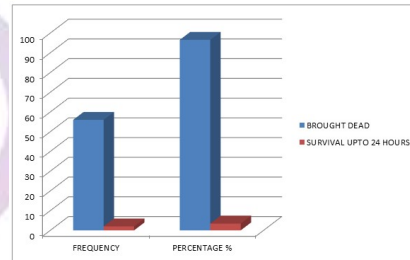


Figure 5

TABLE 4: CAUSE OF ACCIDENT

CAUSE OF ACCIDENT	FREQUENCY	PERCENTAGE %
JUMPING OR LYING INFRONT OF TRAIN	07	12.06
TRESPASSING	27	46.55
FALL FROM A MOVING TRAIN	05	8.62
FALL DURING BOARDING / ALIGHTING	03	5.17
ATTENDING NATURE CALLS	04	6.89
SPEAKING ON MOBILE	11	18.96
RAILWAY EMPLOYEE ON WORK	01	1.72
TOTAL	58	100

Maximum cases of deaths were due to **Trespassing (46.55%)** followed by **speaking on mobile (18.96%)**.

TABLE 6: PATTERN OF EXTERNAL INJURIES

INVOLVING PART	ABRASION FREQUENCY	ABRASION PERCENTAGE %	CONTUSIO N FREQUENCY	CONTUSIO N PERCENTAGE %	LACERATI ON FREQUENCY	LACERATION PERCENTAGE %	FRACTURE FREQUENCY	FRACTURE PERCENTAGE %	FRACTURE PERCENTAGE %
HEAD	24	41.37	11	18.96	07	12.06	14	24.13	
CHEST	14	24.13	22	37.93	13	22.41	07	12.06	
ABDOMEN	11	18.96	12	20.68	12	20.68	05	8.62	
UPPER LIMB	04	6.89	04	6.89	11	18.96	11	18.96	
LOWER LIMB	05	8.62	09	15.51	15	25.86	21	36.20	
TOTAL	58	100	58	100	58	100	58	100	

Maximum abrasions were seen over the **head (41.37%)** followed by **chest (24.13%)**. Maximum contusions were seen over the **chest (37.93%)** followed by **abdomen (20.68%)**. Maximum Lacerations were seen over the **lower limb (25.86%)** followed by chest (**22.41%**). Maximum fractures were seen over the **lower limbs (36.20%)** followed by **head (24.13%)**.

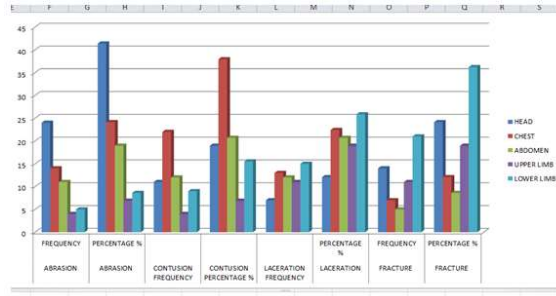


Figure 6

TABLE 7: CAUSE OF DEATH

PATTERN OF INJURY	FREQUENCY	PERCENTAGE %
BLUNT INJURY	09	15.51
HEAD INJURY	11	18.96
SPINAL INJURY	08	13.79
TRAUMATIC TRANSECTION	05	8.62
HEAD AND SPINE	04	6.89
CRUSH INJURY	05	8.62
DECAPITATION	05	8.62
MULTIPLE INJURIES	04	6.89
MULTIPLE INJURIES WITH ALL OTHER INJURIES.	07	12.06
TOTAL	58	100

The cause of death in maximum cases was **head injury (18.96 %)** followed by **blunt injury (15.51%)**.

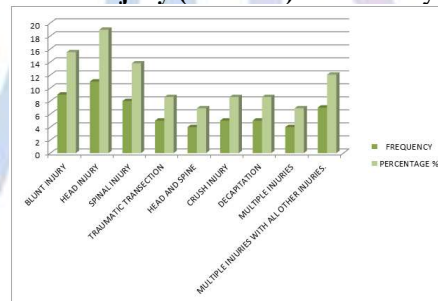


Figure 7

TABLE 8: MANNER OF DEATH

MANNER OF DEATH	FREQUENCY	PERCENTAGE %
SUICIDAL	40	68.96
ACCIDENTAL	18	31.03
HOMICIDAL	0	0
NATURAL	0	0
TOTAL	58	100

Maximum cases were **suicidal deaths (68.96%)** followed by **accidental (31.03%)**.

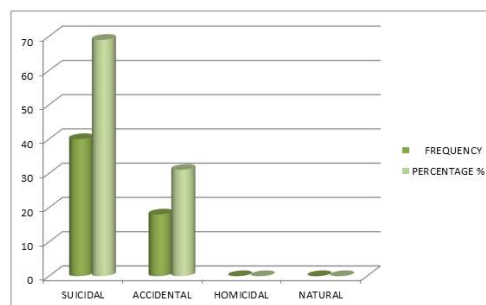


Figure 8

DISCUSSION

Maximum cases of deaths due to train traffic accidents were seen in males (86.20%). This is similar to the study conducted by Mohanty MK, Panigrahi MK, Mohanty S, Patnaik KK⁴. This shows that male fatalities are much more common as they outweigh female fatalities. Maximum deaths were seen in the age group of 31- 40 Years (37.93%) followed by 41-50 Years (27.58%). This is almost similar to the study conducted by Biradar G, Shetty HP, Shetty B, Shetty CK⁶. This could be due to the fact that the young age groups are more vulnerable to suicides / accidents validating their stressful and ambiguous lifestyles. More or less it is the primary 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. Maximum cases of deaths occurred in the morning hours between (6.00 A.M – 12.00 P.M) which is 67.24% followed by evening hours between (6.01 P.M TO 11.59 P.M) which is 22.41%. This is almost similar to the study conducted by T.Mohit Kumar Moses, J Ammani¹. This could be attributed to work time. People get into work in the morning and use public transport like rail network and come back in the evening after work which could have aggravated the issue. Maximum cases of deaths were due to Trespassing (46.55%) followed by speaking on mobile (18.96%). This is similar to the study conducted by T.Mohit Kumar Moses, J Ammani¹. This also can be attributed to work schedule of the working people. Maximum cases were brought dead to our hospital (96.55%). This is in contrast to the study conducted by Prachi Ahuja, Pavanchand Shetty H, Haniel L Dsouza, Jagadish Rao Padubidri, B Suresh Kumar Shetty, Shashidharan Kotian² where people survived for considerable time in the hospital. This could be attributed to fatality involved in Chennai train traffic accidents as people are busy and doing multitasking by lethargically or preoccupied without any safety measures while trespassing / crossing the tracks. Maximum abrasions were seen over the head (41.37%) followed by chest (24.13%). Maximum contusions were seen over the chest (37.93%) followed by abdomen (20.68%). Maximum Lacerations were seen over the lower limb (25.86%) followed by chest (22.41%). Maximum fractures were seen over the lower limbs (36.20%) followed by head (24.13%). This is almost similar to the study conducted by Prachi Ahuja, Pavanchand Shetty H, Haniel L Dsouza, Jagadish Rao Padubidri, B Suresh Kumar Shetty, Shashidharan Kotian².

It can be attributed to the presenting part and its fatality at that material time. The cause of death in maximum cases was head injury (18.96 %) followed by blunt injury (15.51%). This is in contrast to the study conducted by T.Mohit Kumar Moses, J Ammani¹ where multiple injuries was the commonest cause of death. This could be attributed to the position of the body at that material time and it varies from place to place based on the surface and presenting part involved.

Maximum cases were suicidal deaths (68.96%) followed by accidental (31.03%). This is in contrast to the study conducted by Aligbe JU, Akhiwu Nwosu SO¹³ where suicides were less. Our study is similar to the study conducted by Kumar Moses and J Ammani¹. 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

Railway fatalities can pose great challenges to the Medico Legal Expert and investigation officer if they are investigated properly and autopsies conducted by observing everything carefully. The investigating officers should be very careful at the scene of crime in not losing any body parts at the scene of crime as this may lead to serious medico legal issues and many times it has panned like dog bringing any limb, human body parts in front of the hospital / road or any public area leading to a question of foul play/homicide. Therefore the investigating officer should be very careful and search in and around the track if any body parts are missing and then go ahead with their routine procedures.

RECOMMENDATIONS

To reduce Railway Accident Government has to create awareness program in relation to the safety guidelines, which in turn requires equal co operation from the general population. The Government has to invest in the up gradation of the infrastructure, which will improve the safety features.

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