

A Study of Death Due to Railway Accidents: An Autopsy Based Cross Sectional Study Conducted in a Tertiary Care Hospital

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Abstract

A train accident is defined as "Collision, Derailment, or any other event involving the operation of n- track equipment". To estimate the pattern of injuries in Railway Accidents and to estimate the Cause of death and Manner of death in Railway Accidents. The present study is conducted in Department of Forensic Medicine, Government Stanley Medical College from January 2020 to December 2020 in all the cases of Railway Accidents subjected to postmortem examination. During the study period, 61 cases were subjected for autopsy, the most common age group is 20 to 40 years. The most commonly injured organ is Brain followed by Liver and most of them died within 12 to 24 hours prior to post mortem examination. The railway fatalities were more of accidental in nature, less frequently suicidal and rarely homicidal. Internal organs commonly involved Brain followed by spinal cord, liver etc., It is also found that injuries to the upper half of the body are more common when compared to that of lower half of the body. The most common cause of death was hemorrhage shock from Multiple injuries, followed by Head injury, Thoracic injury, and Abdominal injury.

Keywords: Cause of death, Manner of death, Pattern of injuries, Train Traffic Accident.

Introduction

Indian Railway is one of the largest railway network system in the world under a single management. Railway accidents occupy an important role in medical and legal disclosure on trauma and traumatic disorder ⁽¹⁾.

A train accident is defined as "Collision, Derailment, or any other event involving the operation of n- track equipment". Author Bernard knight classified the Railway Accidents into three groups: a. Train Accident, b. Movement Accident and

c. Non-movement Accident ⁽²⁾.

Accidental deaths are unfortunate events due to unawareness, ignorance, carelessness occurred under unforeseen and unplanned events or circumstances. Movement accident has been taken up for the study as the number of fatalities is far more cumulative. Non movement accidents are accidents on railway premises, but not connected with the movement of Railway vehicles ⁽³⁾.

There have been various causes for train accidents ranging from Human Failure to Equipment Failure to

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Sabotage etc. Human failure has caused more than 86% of the total accidents. Out of this, 41% accidents were caused due to the failure of railway staff and the rest due to the failure of others. Equipment failure caused only 2.2% of the accidents⁽⁴⁾.

Track failures and subsequent derailments are caused by twin factors- excessive traffic and underinvestment in rail infrastructure- an Indian Spent analysis of available data shows. Consider this: There has been a 56 % increase in the daily tally of passenger trains over 15 years-from 8,520 in 2000-01 to 13,313 in 2015-16. The number of freight trains increased by 59 % in the same period. But the running track length for all these trains increased by 11 only 12% in 15 years-from 81,865 kilometers to 92,081 kilometers. Slow track expansion and renewal and coach upgrades are the key factors involved ⁽⁵⁾.

The leading cause of deaths in railway accidents was fall from trains/collision of trains with people on tracks, which together accounted for 13,542 deaths. Other causes include - collisions (99 deaths), derailments (59 deaths), and explosion/fire (12 deaths) ⁽⁶⁾. Causes for rest of the cases are not known.

A total of 99 consequential train accidents took place out of which 64 were due to failure of railway staff. Out of the 99 train accidents, 19 were caused due to the failure of factors other than the railway staff⁽⁷⁾.

Aims and Objectives:

- To estimate the pattern of injuries in Railway Accidents.
- To estimate the Cause of death and Manner of death in Railway Accidents.

Material and Methodology

The present study conducted in Department of Forensic Medicine, Government Stanley Medical College mortuary in all the cases of Railway Accident subjected to postmortem examination. Data were collected from the post-mortem records, medical records, inquest reports and Crime scene investigations. The data thus collected were subsequently analyzed and compared with other national and international studies.

Study Design: Cross sectional Study.

Study Population: All the cases of Railway Accident deaths subjected to postmortem examination in Govt. Stanley Medical College mortuary during the study period.

Study Duration: 1 year (January 2020 to December 2020).

Inclusion Criteria: All cases of Railway Accident deaths subjected to postmortem examination in Govt. Stanley medical college mortuary on receiving requisition from the concerned Investigating Officer.

Exclusion Criteria: All the cases subjected to postmortem examination in Govt. Stanley medical college mortuary except Railway Accident deaths.

Results and Observation

Table 1: Age Wise Distribution

AGE GROUP	NO. OF CASES	PERCENTAGE (%)
<20 years	12	19.68%
21 - 40 years	26	42.62%
41 - 60 years	15	24.59%
>60 years	08	13.11%
Total	61	100%

Table 2: Circumstances of Accident

CIRCUMSTANCES OF ACCIDENT	NO. OF CASES	PERCENTAGE (%)
Walking on Track	14	22.96%
Crossing the track	34	55.73%
Lying on track	09	14.76%
Falling from train	04	06.55%
Total	61	100%

Table 3: Pattern of Injuries

A. External Injuries

EXTERNAL INJURIES	NO. OF CASES	PERCENTAGE (%)
Abrasions	61	100%
Contusions	38	62.29%
Lacerations	54	88.52%
Swelling and Deformity	23	37.70%
Decapitation	07	11.47%
Crush Injury	51	83.60%
Transection	16	26.22%

B. INTERNAL INJURIES

INTERNAL INJURIES	NO. OF CASES	PERCENTAGE (%)
Lungs	34	55.73%
Liver	48	78.68%
Kidney	18	29.50%
Spleen	16	26.22%
Brain	52	85.24%
Spinal cord	49	80.32%
Stomach	11	18.03%
Bowel	19	31.14%
Fractures	43	70.49%
Diaphragm	14	22.95%
Heart	17	27.86%
Urinary Bladder	09	14.75%
Testes	02	03.27%
Internal Bleeding	47	77.04%
Intrapleural Bleeding	36	59.01%
Intraperitoneal Bleeding	22	36.06%

Table 4: Manner of Death

MANNER OF DEATH	NO. OF CASES	PERCENTAGE (%)
Suicidal	17	27.86%
Accidental	42	68.85%
Homicidal	02	03.27%
Total	61	100%

Table 5: Cause of Death

CAUSE OF DEATH	NO. OF CASES	PERCENTAGE (%)
Head Injury	06	09.83%
Thoracic Injury	04	06.55%
Abdominal Injury	03	04.91%
Multiple Injuries	48	78.68%
Total	61	100%



Figure 1: Grease Stain

Figure 2: Decapitation



Figure 3: Head Injury

Figure 4: Head and Chest Injury

Discussion

In the present study, the most common age group is 20 to 40 years (42.62%), which was similar to a study conducted by Pelletire A⁽⁸⁾. Males were predominant (78.69%), which was similar to a study conducted by Puttaswamy⁽⁹⁾. Time of accidents, most of them occurred during the morning hours (55.74%). Most of the victims had the regular habit of crossing the track (55.73%). All the cases were dead on spot and the bodies were found to lie outside the railway track. In most of the cases, grease stains were present. The most commonly injured organ is brain (85.24%) followed by liver (78.68%) and most of them died within 12 to 24 hours prior to post mortem examination.

The pattern of external injuries were abrasions (100%), contusions (62.29%), lacerations (88.52%), swelling and deformity (37.70%), decapitation (11.47%), crush injury (83.60%) and transection (26.22%). The pattern of internal injuries were lungs (55.73%), liver (78.68%), kidney (29.50%), spleen (26.22%), brain (85.24%), spinal cord (80.32%), stomach (18.03%), bowel (31.14%), fractures (70.49%), diaphragm (22.95%), heart (27.86%), urinary bladder (14.75%), testes (03.27%), internal bleeding (77.04%), intrapleural bleed (59.01%), intraperitoneal bleeding (36.06%).

The most common manner of death in the present study is Accidental (68.85%), followed by Suicidal (27.86%) and Homicidal (03.27%) and most of the deceased died of Multiple injuries (78.68%), followed by Head injury (09.83%), Thoracic injury (06.55%), and Abdominal injury (04.91%).

Conclusion

During the study period from January 2020 to December 2020 a total of 61 cases were studied. In the present study showing the males were more prone to railway Accidents than female. The maximum incidence of the cases was seen in the third and fourth decades of life. The accidents were more during the morning hours (5AM to 12PM) when the people rush to workplaces, schools, colleges etc.,

The railway fatalities were more of accidental in nature (68.85%), less frequently suicidal (27.86%) and rarely homicidal (03.27%). The accidental deaths by railway injuries occurred mostly while crossing the track or walking along the track.

From the analytical study of the railway Fatality injuries, Internal organs commonly involved are brain followed by spinal cord, liver etc., It is also found that injuries to the upper half of the body are more common when compared to that of lower half of the body. The most of the deceased were died of Multiple injuries, followed by Head injury, Thoracic injury, and Abdominal injury.

Conflict of interest if any: NONE.

Privacy / Confidentiality of the study subjects: Maintained.

Sponsor details: Not Applicable.

Compensation: Not Applicable.

Insurance: Not Applicable.

Ethical Clearance: Obtained from Institutional Ethics Committee. **IEC meeting held on 12.12.2019 at the council hall, Stanley Medical college, Chennai-1 at 10.00AM**

NAME OF ETICAL COMMITTEE: Institutional Ethical Committee, Stanley Medical College, Chennai
-1. Certificate Number: 06/2019/FM/ IEC/ SMC

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