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Research Article

PATTERN OF INJURIES IN FATAL ROAD TRAFFIC ACCIDENTAL CASES (AN AUTOPSY-BASED STUDY)

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ABSTRACT

Aim: The aim of this study was to analyze the patterns of injuries in road traffic accidents (RTAs) through autopsy-based examinations, focusing on the demographics of victims, types of injuries sustained. **Material and Methods**: This observational survey study was conducted at the mortuary of the District Hospital, Nashik, over a one-year period from September 2015 to August 2016. The study included 385 victims of RTAs whose deaths occurred within the Nashik district. Data was collected from post-mortem examinations, inquest reports, and hospital records. The patterns of injuries were evaluated, and statistical analysis was performed using the Chi-square test with SPSS version 21.0, considering a p-value of less than 0.05 as statistically significant. **Results:** The majority of RTA victims were males (82.60%) aged between 20-29 years (33%). **Conclusion:** The findings highlight the high mortality and severe injuries sustained in RTAs, particularly in middle-aged males. Some factors like lack of traffic laws, traffic mix, drunken and rash driving, poor conditions of the road and head injuries are key contributors to fatalities, underscoring the need for enhanced road safety measures and timely medical intervention.

INTRODUCTION

Head injuries are one of the representatives of today's social problems. Its impact causes either loss of life or loss of intellectual and other faculties with a resulting burden on family and society. Victims of road traffic accidents frequently belong to the young age group which increases burden's severity. According to 2014 report from National Crime Record Bureau of India, 1589 persons were killed in Maharashtra due to fatal road traffic accidents[1]. The most affected demographics young individual's aged 15 to 29 years, with over 50% of road traffic deaths occurring in this economically productive age group [2]. The mortality rate is steadily rising. Incidents of RTA's in India are increased due to some factors like lack of traffic laws, traffic mix, drunken and rash driving, poor conditions of the road etc.

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Among the leading causes of death in the World, road traffic accidents ranked 9th during the 1990's. It would become the 2nd leading cause by the year 2020 if the same situation continued [3]. Nashik, is an ancient holy city with 15,582 [4] sq.kms area in the northwest region of Maharashtra, being homely and center for tourist destinations. It has a moderate per capita income and good literacy rate. It had 2722049 motorized vehicles in 31st March 2015[5] which are registered in Nashik, run over 1,840 kms, of roads including National Highway, State Highway and internal roads all over Nashik. Road traffic accidents have always been a leading cause of head injuries which has significantly raised the mortality rate. If no effective measures are taken, road traffic crashes are expected to result in approximately 1.19 million deaths annually by 2023 [6]. An attempt has been made here to study head injury deaths during autopsy examination of road traffic accident victims referred for medico-legal autopsy examination to the Civil Hospital Nashik district. Understanding the patterns of injuries leading to fatalities in road traffic accidents is crucial for developing effective preventive strategies.

An attempt has also been made to suggest safety measures for preventing such loss of human lives.

MATERIAL AND METHODS

The study was conducted at the mortuary of the District Hospital, Nashik. The material of the study comprised three hundred and eighty-five victims (385) of head injury deaths due to road traffic accidents. It employed an observational survey study design focusing on victims of road traffic accidents (RTAs) brought to the mortuary for post-mortem examination during the study period. The inclusion criteria involved deaths caused by road traffic accidents within Nashik district, while the exclusion criteria excluded deaths due to Railway accidents and Air craft crashes. The study was carried out over a one-year period, from September 2015 to August 2016.

Ethical approval for the study was obtained from the Institutional Ethics Committee, and permission for data collection was granted by the Chief Medical Officer (CMO) of the District Hospital, Nashik. The data for this study was sourced from the record of medicolegal post-mortem examinations performed during the study period at the District Mortuary. Data collection involved assessing the pattern of injuries among RTA victims through autopsy examinations. These examinations were carried out using standard post-mortem instruments, including scalpels, organ knives, brain knives, scissors, bone cutters, and rib shears. Inquest reports (*Panchnama*) were reviewed, and additional information was obtained from investigating officers, eyewitnesses, relatives, and friends of the deceased. The detailed findings of each case were recorded individually in a separately designed Head Injury Performa. In addition to the autopsy instruments, data records such as inquest reports, hospital documents, and post-mortem findings were critical in gathering comprehensive data for the study. The findings obtained are expressed in tabular form for each parameter and analyzed statistically. The results are discussed in light of available literature.

Data Analysis: All collected data were entered in to an MS Excel spreadsheet and analyzed using the Statistical Package for Social Sciences (SPSS)version 21.0. The Chi-square test was employed for statistical analysis, and a p-value less than 0.05 was considered statistically significant.

RESULTS

Table 1: Age-wise Incidence

Age group (years)	No. of victims	Percentage (%)
0-9	1	0.25
10-19	15	3.89
20-29	127	33
30-39	79	20.51
40-49	76	19.74
50-59	45	11.7
60-69	27	7
70-79	12	3.11
80-89	3	0.8

The age distribution of road traffic accident (RTA) victims revealed that the majority of victims were in the 20-29 years age group, representing 33% of the total cases. This was followed by the 30-39 and 40-49 age groups, comprising 20.51% and 19.74% of the total cases, respectively. Younger individuals, below 19 years, made up 3.89% of the victims, while elderly individuals aged 50-59 years and above contributed 11.7% of the cases. The least number of victims were in the >80 age group, accounting for just 0.8%. The mean age of the victims was 42.78 years, indicating that middle-aged adults were the most affected by road traffic accidents.

Table 2: Sex-wise Incidence

Sex	No. of victims	Percentage (%)
Male	318	82.60%
Female	67	17.40%
Sex Ratio (M)	4.8	

In terms of gender distribution, males were overwhelmingly represented, accounting for 82.60% of the total victims, while females constituted only 17.40%. This male dominance in road traffic accidents is consistent

with global data, likely due to higher exposure of males to traffic environments, either as drivers, riders, or pedestrians. The male-to-female ratio in the study was calculated to be 4.8:1, showing that males are at a significantly higher risk of RTAs compared to females.

Table 3: Month-wise Incidence

Month	No. of cases	Percentage (%)
September 2015	24	6.23
October 2015	35	9.09
November 2015	43	11.16
December 2015	33	8.6
January 2016	34	8.83
February 2016	37	9.61
March 2016	34	8.83
April 2016	39	10.12
May 2016	31	8.05
June 2016	25	6.5
July 2016	28	7.27
August 2016	22	5.71

Among the months maximum accidents were reported in month of November 11.16% whereas least in month of August 5.71%. Change in weather patterns in November, such as fog or rain, could contribute to accidents.

Table 4: Type of External Injuries

Nature of injury	Number	Percentage (%)
Abrasion only	71	18.44
Contusion only	165	42.86
Laceration only	111	28.83
Combination of all above injuries	37	9.61
Healthy	1	0.26

The most common types of external injuries were contusions (bruising), which were found in 42.86% of victims, followed by lacerations (28.83%), and abrasions (18.44%). Combination of the all above injuries seen in 9.61% of cases.

Table 5: Pattern of Head Injuries

Type of hemorrhage	No. of cases	Percentage
EDH	206	23.54
SDH	322	36.80
SAH	293	33.49
ICH	54	6.17
Type of Skull Fracture (n=206)		
Fissured	185	89.81
Depressed	5	2.43
Comminuted	15	7.25
Nil	1	0.48

The majority of hemorrhages were subdural (36.80%) followed by subarachnoid (33.49%), and extradural (23.54%). Skull fractures were observed in 80.5% of cases, with fissured fractures being the most common (89.81%), followed by comminuted fractures (7.28%). These results underscore the significant role of head trauma in RTAs, which often leads to severe neurological damage or death.

DISCUSSION

The age distribution in the present study shows that the majority of road traffic accident (RTA) victims fell within the 20-29 years age group (33%), followed by 30-39 years (20.51%) and 40-49 years (19.74%). These findings are consistent with several studies that indicate younger and middle-aged adults are the most vulnerable to RTAs due to their higher mobility and frequent use of vehicles for work and social activities. A study by Kumar et al. [7] reported a similar distribution, with the highest number of RTA victims in the 21-30 age group (25%), followed by the 31-40 age group (18%). Additionally, WHO data also shows that RTAs are the leading cause of death among individuals aged 15-29 years globally [8].

Males constituted the overwhelming majority of victims (82.60%) in this study, with a male-to-female ratio of 4.8:1. The incidence of male preponderance is probably due to their involvement in most of out-door chores. Still, female are not seen driving vehicles like bus, trucks etc. The carrier and public transport vehicle drivers are male, in almost all cases, thus facing danger of traffic accident, which is responsible for higher fatality among them. David & Sundaram [9], Sevitt [10] Kumar & Qureshi [11], and Chandulal [12] also found higher incidence in male. The higher exposure of males to traffic environments, whether as drivers, pedestrians, or riders, is often cited as the reason for this gender discrepancy.

Contusions (42.86%) and followed by lacerations (28.83%), and abrasions (18.44%). were the most common types of external injuries observed in this study fractures occurred in 53.50% of victims. These findings are uniform with the patterns described in studies by Pathak et al. [13], where soft tissue injuries like contusions and abrasions were the most frequent injuries in RTAs, followed by bone fractures. Such injuries reflect the high-energy trauma sustained in road accidents, particularly in high-speed collisions.

Subdural hemorrhage was the most common type of intracranial bleeding observed in 36.80% of the cases. These findings are consistent with studies by Patel et al [14], which showed that head trauma and intracranial hemorrhage are the leading causes of death in RTAs. Skull fractures were present in 53.50% of cases, with fissure fractures being the most common type (89.81%). Skull fractures particularly when associated with hemorrhage, are often fatal and account for a large portion of RTA mortalities.

CONCLUSION

Though tremendous development in diagnosis and management of head injury taken place, but still outcome of complete recovery is unpredictable. Even today we can say, “no head injury is too trivial to be ignored and too severe to be despaired off”. A person who appears clinically sound may die within 72 hours and head injury with extensive brain damage can survive for a longer period which may allow time to provide medical help. In conclusion, this autopsy-based study highlights the critical patterns of injuries observed in road traffic accident (RTA) victims, emphasizing the severity of head injuries. The majority of victims were males especially among middle-aged individuals with a significant portion of fatalities resulting from head trauma and hemorrhage. These findings stress the need for improved road safety measures, stricter traffic regulations, and timely medical intervention to reduce the burden of RTAs on public health.

REFERENCES

1. 2014.https://data.gov.in/resources/stateut-wise-total-number-road-accidents-persons-killedinjured-fatal-accidents-due-other-2
2. Mohan D. Road traffic injuries- a neglected pandemic. Bull World Health Organ. 2003; 81(9): 684.
3. WHO, 1995. The World Health Report1995, Report of the Director General WHO.
4. shodhganga.inflibnet.ac.in/bitstream/10603/9993/8/08_chapter%203.pdf
5. http://mahatranscom.in/pdf/NewMTS2014-2015.pdf
6. https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/global-status-report-on-road-safety-2023
7. Kumar A, Verma A, Bhardwaj A. Epidemiological study of road traffic accident cases attending tertiary care hospital, Mirzapur, India. Int J Med Res Rev. 2018; 6(8): 434-438. https://doi.org/10.17511/ijmrr.2018.i08.05
8. World Health Organization. Global status report on road safety 2018: Summary. Geneva: World Health Organization; 2018. https: //www.who.int/publications/i/item/9789241565684
9. David, S. and Sundaram, C. L:” Traffic Accidents – Analysis of cases during 1961-1970”: Journal of the Indian Academy of Forensic Sciences, 14(1), 1975:28-34.

10. Sevitt, S., Fatal Road Accidents- Injuries, Complications and Causes of death in 250 subjects. British Journal of Surgery, 55, (7), July 1968: 481-505.
11. Kumar A, quereshi, G., Agarwal, A.,and Pande A: "Profile of Thorasic Injuries with special reference to road traffic accident". Journal of the Indian academy of Forensic Medicine, 21(4), 1999: 104-110.
12. Chandulal, R. Fatal Head Injuries in Auto Mobile Accidents - A Study of 74 Cases, The Clinician, Mar.1975, 39(3): 104-108.
13. Pathak A, Deshpande S, Chugh Y. Study of injury pattern in road traffic accidents in central India. J Forensic Res. 2018; 10(1): 450-454. https://doi.org/10.4172/2157-7145.1000450
14. Patel S, Gupta S, Agarwal A. Pattern of skull fractures in road traffic accidents: A study at a tertiary care hospital in India. J Neurosci Rural Pract. 2018; 12(2): 247-251.https://doi.org/10.1055/s-0041-1726173.

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