Profile of Fatal Road Traffic Accident Cases in Srikakulam District - An Autopsy-Based Study

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ABSTRACT

BACKGROUND

Road Traffic Injuries (RTA's) are a major but neglected global public health problem requiring concerted efforts for effective and sustainable prevention. Road traffic accident is one of the major causes of morbidity and mortality in developing countries, including India. Srikakulam is the northern district in Andhra Pradesh state which has 194 kilometres of National Highway (NH) passing through it from Ichapuram to Pydibheemavaram. Frequent median openings, poorly designed access roads from the adjacent areas of highways and lack of effective enforcement to control wrong side vehicular movements on NH16 have led to an increase in number of road accidents in this region. We wanted to study the demographic distribution of cases, assess the nature and cause of deaths certified after post-mortem examinations, and evaluate the pattern and distribution of injuries associated with road traffic accidents.

METHODS

It is a record-based study, a total of 422 autopsies done in the year 2019 were studied, of which 131 were due to RTA's. Data regarding 131 RTA's was analysed using the records available with the Forensic Medicine department. Institutional Ethical Committee (IEC) approval was taken.

RESULTS

In our study, 78 % were men, and 22 % were women. 41 - 60 years age group showed the highest number of victims (38 %) (49). Head injuries were most common (54.6 %), followed by multiple injuries (27.6 %) and chest injuries (8.4 %). The study reported more accident-related deaths during the month of May (22 %), followed by April (11.4 %).

CONCLUSIONS

Head injuries and subdural & sub arachnoid hematoma are the leading causes of death from RTAs.

KEYWORDS

Autopsy, Cause of Death, Fatal Road Traffic Accidents, Injuries, Pattern of Injuries

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BACKGROUND

Road Traffic Accidents (RTA) are increasing at an alarming rate throughout the world**.** Accidents constitute a complex phenomenon of multiple causation. The aetiological factors are classified into human and environmental factors. There is a steep rise in vehicular accidents in present era due to urbanisation and tremendous growth in road transport sector.[1] Accidents represent a major epidemic of non-communicable diseases in the present century. Accidents have their own natural history and follow the same epidemiological pattern as any other disease, i.e., the agent, the host, and the environment interacting together to produce injury or damage.[2]

Road traffic accidents continue to be one of the leading causes of death in developing countries and constitute a bulk of medico-legal autopsy cases conducted in India. Road traffic accidents are the major cause of sudden unnatural deaths.[3] In 2014, world health day, organised by the World Health Organisation (WHO), for the first time had been devoted to road safety. Millions of others sustain injury, with some suffering permanent disabilities. No country is spared this toll in lives and suffering, which strikes the young particularly. Enormous human potential is being destroyed, with also grave social and economic consequences. Road safety is thus a major public health issue throughout the world.[4] According to WHO 2019 fact sheet, 1.35 million people die every year as a result of road traffic crashes across the world, and deaths from road traffic injuries account for around 25 % of all deaths from injury.[5] Prevention of road traffic accidents will be contributing to reduction of mortality and morbidity among the population. Studying road traffic accidents in local scenarios help in understanding the problem and same can be used for recommending necessary changes in the existing programmes.[6] The case fatality, morbidity, outcomes will vary by the type of injury and site of injury. Head injuries and limb injuries have more economical impact. Injury to head or vital areas of the body may have poor outcomes, also they require immediate attention and medical care right from the place of accident to the hospital including special requirements during the transport via a properly trained personal and equipment in an ambulance.[7] Though road traffic accidents do happen throughout the year yet some studies and preliminary feasibility studies in this institute are pointing towards a difference in number of accidents that happened are varying based on the months in which major festivals or auspicious days, fairs, market days, seasonal crops, harvesting period might be contributing to the increased accidents which needs to be further studied

Visibility of the road travelled varies with lighting which can be natural light like sunlight or artificial lighting like streetlights, light from the vehicle or light from the opposite vehicles, presence of dividers etc.,

Srikakulam is the northern district in Andhra Pradesh state, coastal district with varied geography like coastal areas where roads are exposed to regular rain falls, erosions, the loose soil in the geography, also damage roads causing difficulties for the people who drive a two-wheelers or a four wheelers, pedestrians. Srikakulam district has 194 kilometres of National Highway (NH) passing through it from Ichapuram to Pydibheemavaram. Increased vehicle speed, mixed traffic, poor-road conditions have led to an increase in the number of road traffic accidents in this region. Injury to head and face was most common followed by chest injuries. Hence, the study is taken up with an objective."

We wanted to study the demographic distribution of cases, assess the nature and cause of deaths certified after post-mortem examinations and determine the pattern and distribution of injuries associated with road traffic accidents.

METHODS

It is a record-based cross-sectional study which was conducted regarding all the post-mortem cases done during January 1st, 2019 to 31st December 2019 performed at the mortuary attached to the Forensic Medicine & Toxicology Department at Government Medical College, Srikakulam. A pretested questionnaire was used. Information regarding age, gender, place of residence, cause of death, and pattern & distribution of injuries were obtained from the records.

Ethical Clearance

IEC was approached for the approval. The study protocols, aims, objectives and anticipated outcomes of the study and other details as requested by the IEC were presented before it. Further approval from Institutional Ethical Committee (IEC) was issued according to the study and data is analysed as mentioned in the protocols

Data Collection

A preliminary feasibility study was attempted to know whether this study is feasible to conduct in the institute and after finding it feasible, study was conducted as per the designed protocol, visited the autopsy medical records section and collected the information of autopsy from the register

Statistical Analysis

The data was analysed using Microsoft Excel Sheet, and relevant statistical tests like proportions were applied.

RESULTS

A total of 422 post-mortem examinations were conducted during the study period. Around 41.2 % (n = 174) of the deceased persons belong to the age group of 31 - 50 years. Among them, 75.3 % are men, and 24.6 % are women. Out of 422 post-mortem examinations performed, 32 % (n = 131) were due to RTA, followed by poisoning 19 % (77). Other causes of deaths include drowning (10 %), railway accidents (10 %), hanging (6 %) & electrocution (5 %). On analysis of RTA victims autopsy records (n = 131), multiple body parts were involved in each case. Injuries to head &

face were observed in 70 cases comprising 54.6 % of all injuries, and subdural hemorrhage (47 %) was the commonest among the intracranial hemorrhages. Next common injuries were seen in the chest in 11 persons.

Age (In Years)	No. of Cases n (%)
< 1	1 (0.8)
1 - 10	5 (3.8)
11 - 20	8 (6.1)
21 - 30	18 (13.7)
31 - 40	19 (14.5)
41 - 50	27 (20.6)
51 - 60	24 (18.3)
61 - 70	21 (16)
71 - 80	6 (0.04)
> 80	2 (0.01)
Total	**131 (100 %)**

Table 1. Age-Wise Distribution of RTA Cases

Area	No. of Cases n (%)
Rural	85 (65)
Urban	46 (35)
Total	**131 (100)**

Table 2. Area Wise Distribution of RTA Cases

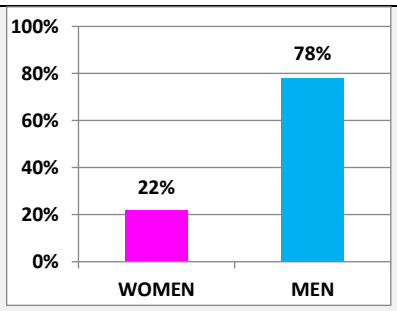

Figure 1. Gender Wise Distribution of RTA Cases

Months	Number of Accidents (%)
January	12 (9.1)
February	8 (6.1)
March	14 (10.6)
April	15 (11.4)
May	28 (21.4)
June	9 (6.8)
July	12 (9.1)
August	6 (4.5)
September	6 (4.5)
October	9 (6.8)
November	4 (3.1)
December	8 (6.1)
Total	**131 (100)**

Table 3. Month-Wise Distribution of RTA Deaths

Site of Injuries	No. of Cases n (%)
Head &Face &Neck	71 (54.6)
Multiple injuries	36 (27.6)
Chest	11 (8.4)
Abdomen	5 (3.8)
Pelvis	6 (4.6)
Lower limb	2 (1.5)
Upper limb	0 (0)
Total	**131 (100)**

Table 4. Sites of Injuries in Road Traffic Accidents

Type of Injury	No. of Cases n (%)
Subdural & Sub arachnoid hematoma	48 (36.1)
Fractures	32 (24.6)
Lacerations	25 (19.2)
Crush injuries	26 (20)
Total	**131 (100 %)**

Table 5. Distribution of Cases According to Type of Injuries

38 % of RTA deaths were in the age group of 41 – 60 years. Most (65 %) of the deaths were reported from rural areas. Men (78 %) are more affected than women (22 %). The highest number of RTA autopsies were done in the month of May, followed by April & March. Least number of deaths reported in November. Head injuries were most common (54.6 %), followed by multiple injuries (27.6 %). Subdural & sub arachnoid haematoma (36.1 %) were reported in autopsy records followed by fractures (24.6 %).

DISCUSSION

Road traffic accidents are increasing with rapid pace and presently these are one of the leading causes of death in developing countries. Vander Suis et al has reported that traffic is the most important cause of severe injuries and three quarters of severely injured cases who died during hospitalisation are victims of traffic accidents.

- In the present study, the majority (38 %) of deaths due to RTA occurred in the age group of 41 – 60 years, followed by the age group of 21 to 40 years (28 %).

Our findings regarding age distribution are in variance with a study conducted by Srinivasa Kumar, and Srinivasan who found that 52.5 % of cases involved in RTA's are in the age group of 21 – 30 years.[8] Singh & Dhattarwal has observed that the most frequent age group affected was 21 - 30 years.[1] Ganveer et al., in their cross-sectional study in central India, found the highest number of accidents were observed in the age group of 18 – 37 years.[9] In a study conducted by Supriya Satish Patil et al., the highest number of victims (29.4 %) were between the age group of 20 - 29 years.[10] Mirza FH revealed that the most vulnerable age group for road accidents was between 19 and 40 years.[11] Mariam Arif et al. revealed a higher number of road accidents were between 21 to 40 years of age.[12] In a similar study, Kumar NB in India showed the majority of the victims were between 21 - 30 years of age.[13]

- Our study has found that the majority of RTA victims, 103 (78 %) were men, and only 28 (22 %) were women. However, more deaths occurred in rural areas (65 %). The gender difference is probably related to both exposure and risk-taking behaviour.
- Our study reported more accident-related deaths during the month of May (22 %), followed by April (11.4 %)

A study in Nigeria on road traffic accident deaths reported that accident cases occur mostly during the rainy monsoon season.[14] Binod Kumar et al., observed maximum cases during the rainy season (July to October). Dhillon Sangeet et al. noted maximum cases in Shimla during winter due to slipping on the road.

- In our study, head injuries were most common (54.6 %), followed by multiple injuries (27.6 %) and chest (8.4 %).

Studies by other authors, a great majority of fatal RTA victims have received multiple external injuries. Singh & Dhattarwal have also recorded involvement of multiple body parts in each case. Abrasion, laceration, fractures, dislocation, head and visceral injuries were more commonly observed in fatal RTA. Mirza FH et al., Jooma R et al., and Mariam Arif, reported that head injuries are the most common site of injury.[11,12] In contrast, a study by Abhishek

Singh et al. reported the maximum number of RTA injuries at the abdomen.[15] Shokouhi M. and Rezapur Shahkolai F indicated that more than half of cases suffered multiple injuries.[16]

CONCLUSIONS

The present study highlights the demography and pattern of injuries in RTA. Approximately 1 / 3rd (38 %) of the reported deaths were from 41 - 60 years age group. Nearly 2 / 3rd (78 %) of the victims were men. In our study, it was observed that intracranial hemorrhage contributed either directly or indirectly to death. There is a need to stress the importance of usage of helmets, seatbelts, and adherence to traffic rules to reduce the incidence of RTA's. More deaths occurred in rural areas, as there is a transformation of lifestyle, increased commuting between rural and urban areas for livelihood, acquiring own vehicles mostly two-wheelers, lack of proper education about speed, poor road condition, and negotiating curves at high speeds. As discussed above, there are many causative factors involved in RTAs which include interaction of users, type of vehicle and road environment. Hence, a multidimensional approach is required to prevent RTA's. There is a need for educating the general public about traffic rules. Strengthening of emergency medical care will help in reducing the consequences of injuries during RTA's. Organised teamwork by all departments like education, engineering, law, medical and health is required for effective prevention of RTAs.

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REFERENCES

[1] Harnam S, Dhattarwal SK. Pattern and distribution of injuries in fatal road traffic accidents in Rohtak (Haryana). JIAFM 2004;26(1):20-23.
[2] Park K. Park's textbook of Social & preventive medicine. 25th edn. Banarasidas Bhanot Publishers 2019: p. 436-444.
[3] Surender J. Pattern of injuries in fatal road traffic accidents in Warangal area. J Indian Acad Forensic Med 2013;35(1):55-59.
[4] World Health Day: Road safety is no Accident!
[5] World Health Organisation. Global status report on road safety 2019: Road traffic injuries-Key facts. https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries
[6] James SL, Lucchesi LR, Bisignano C, et al. Morbidity and mortality from road injuries: results from the Global Burden of Disease Study 2017. Inj Prev 2020;26(Suppl 1):i46-i56.
[7] Ravi BK, Goel N, Kumar B, et al. A pattern of injuries in road traffic accidents in Ranchi, Jharkhand: an Autopsy based study. Int J Med Res Prof 2017;3(5):115-117.
[8] Kumar SPV, Srinivasan K. To study the socio-demographic profile of the road traffic accident victims in the district hospital, Karimnagar. Int Res Dev Health 2013;1(3):136-140.
[9] Ganveer GB, Tiwari RR. Injury pattern among non-fatal road traffic accident cases: A cross-sectional study in Central India. Indian J Med Sci 2005;59(1):9-12.
[10] Patil SS, Kakade R, Durgawale P, et al. Pattern of road traffic injuries: a study from Western Maharashtra. Indian J Community Med 2008;33(1):56-57.
[11] Mirza FH, Hassan Q, Jajja N. An Autopsy-based study of death due to road traffic accidents in the metropolis of Karachi. J Pak Med Assoc 2013;63(2):156-160.
[12] Mariam A, Ahmed M, Rasool SH. Road traffic accidents: an Autopsy based study in Multan. Professional Med J 2015;22(5):621-626.
[13] Awasthi B, Raina SK, Verma L. Epidemiological determinants of road traffic accidents in a mostly rural hilly population. J Sci Soc 2019;46(3):79-85.
[14] Eke N, Etebu EN, Nwosu SO. Road traffic accident mortalities in Port Harcourt, Nigeria. Anil Agarwal's Internet J Foren Med Toxicol 2000;1:1-5.
[15] Abhishek S. An Epidemiological study of road traffic accident cases at a tertiary care hospital in rural Haryana. IJCM 2011;23(2):53-55.
[16] Shokouhi M, Rezapur-Shahkolai F. Fatal Road Traffic Injuries in Hamadan Province, Iran. Journal of Disaster & Emergency Research 2018;1(2):67-74.