ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ROAD TRAFFIC ACCIDENTS (RTA): AN AUTOPSY BASED COMPARATIVE STUDY OF PATTERN & PROFILE OF FATALITY IN HARYANA REGION

Forensic Medicine

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ABSTRACT

Road Traffic Accidents (RTA) continue to be one of the leading causes of death, disabilities and hospitalization in our country and all over the world despite our efforts to bring down the number of accidents and subsequent mortality and morbidity. The purpose of the current study is to analyze the data collected from autopsies of 100 victims of fatal road traffic accidents categorized on the basis of age, sex, type of vehicle, category of road user involved, pattern and distribution of injury sustained depending upon the vehicle involved. The analyzed data is further compared with various other studies done at National level, WHO global status report on road safety published in 2018 and findings of road accidents in India - 2017 report by Ministry of Road transport and highways. The basic purpose of the analysis is that the data derived could be used to formulate policy responses to achieve reduction in road traffic accidents and subsequent fatalities.

KEYWORDS

Road Traffic Accident (RTA), Autopsy, Injuries, Death.

INTRODUCTION:

The number of road traffic deaths continues to rise steadily, reaching 1.35 million globally in 2016[1]. As per official report of Indian government 1.47 lakh deaths were recorded in 2017 on Indian roads as a result of accidents[2]. RTA is expected to be the seventh leading cause of death by the end of year 2030 if proper intervention is not made. With ever growing population and consequent motorization of masses, the issue of road traffic accidents (RTA) and the heavy losses to life and economy which it causes has taken centre stage in global discussion. UN sustainable development goals (SDG) have set an ambitious target to halve the number of global deaths and injuries from road traffic accidents by 2020[3]. The issue of road accident in India is multifaceted with rash driving, alcohol influence, bad road engineering with widespread disregard for road manners among the major causative factors for accidents and general avoidance of using safety measures like helmets, seat belts, antilock braking system etc. leading to high mortality and morbidity on Indian roads.

MATERIALS AND METHODOLOGY:

The present study was carried out in the department of Forensic Medicine and Toxicology, Pt. B. D. Sharma PGIMS, Rohtak. The collected data is derived from post mortem examination (PME) reports of 100 fatal cases of victims of road traffic accidents (RTA) out of total cases which were conducted by the **first author** from May 2012 to April 2015. The victims involved were **members** / subject from all age groups and from both sexes. The information regarding circumstances around accident was collected from the hospital record of the deceased (if any) and police papers apart from interviewing the close relatives of the deceased accompanying the body to the mortuary and confirmed again from the respective investigation officers (IO) of each case at the time of post mortem examination to rule out any false information due to hearsay evidence.

Collected data was arranged into tables and charts based on age and sex profile of victims, type of vehicles or category of road users involved in accident etc. Simple injuries were excluded from the study and fatal injuries were included in the present study in reference to the post mortem cases included in study. Tabulated data was then analysed and compared with various official reports including WHO's 'Global status report on road safety 2018' and Ministry of Road transport and highways 'Road accidents in India-2017' reports and other reports published on basis of similar studies.

RESULTS:

On the basis of collected data following observations were made:

Table I: Showing age group distribution of victims of RTA:

Sr. No	Age group (in years)	Total victims
1.	0-20	14
2.	21-40	56
3.	41-60	22
4.	61-80	7
5.	>81	1
TOTAL		100

Table II: Showing fatalities based on means of transport / category of road users:

Sr. No	Type of vehicle	Number
1.	Light motor vehicle / Car	12
2.	Heavy motor vehicle/ Truck/ Bus	6
3.	Motor Bike	45
4.	Auto rickshaw	6
5.	Non motorized vehicle / Cycle	6
6.	Pedestrian	22
7.	Tractor	3
	Total Cases	100

Table III: Showing nature of injuries depending on the type of vehicle/ category of road user involved in the accident:

Sr. no	Type of vehicle involved	Head injury	Thoracic injury	Abdominal & pelvic injury	Limb fractures
1.	Light motor vehicle/ car	8/12	5	6	8
2.	Heavy MV/ truck/ bus	3/6	3	5	4
3.	Motor Bike	32/45	24	21	26
4.	Auto rickshaw	4/6	4	-	2
5.	Non motorized vehicle/cycle	5/6	4	1	1
6.	Pedestrian	17/22	10	12	9
7.	Tractor	1/3	3	2	-

Chart I:

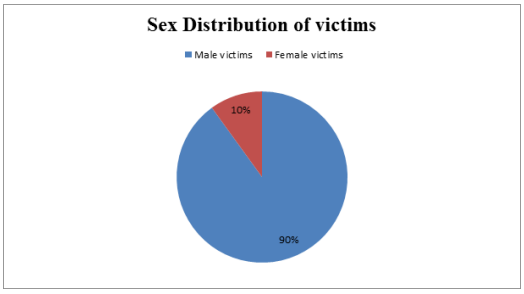


Chart II: Showing offending vehicle / responsible for mishap:

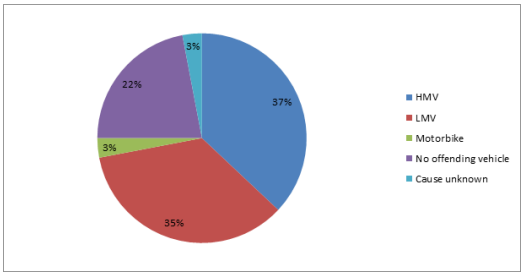
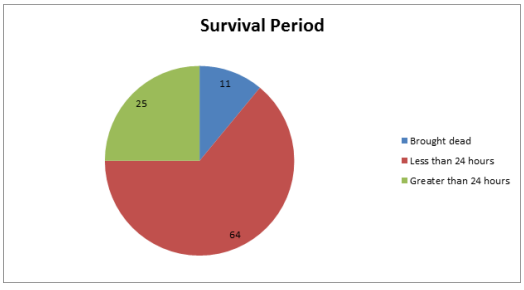


Chart III: Showing survival period of victims:



DISCUSSION:

As per official report a total of 4,64,910 road accidents have been reported by States and Union Territories (UTs) in the calendar year 2017, claiming 1,47,913 lives and causing injuries to 4,70,975 persons [(2)]. Based on the same report the gender-wise comparison in road accident deaths for the year 2017 revealed that the total number of males and females killed were 1,27,787 (86.4%) and 20,047 (13.6%) respectively on national level. In our study the same percentage came out to be 90% and 10% respectively. It shows that the national average and state average are almost comparable.

The youngest victim was a three month old child while the eldest was 85 years old. Apart from the age group distribution shown in table I, the number of victims in the working age group i.e. 18-60 years was 87, among which the young adult population comprising of victims in the age group of 18-45 years was 67. Young adults in the age group of 18 - 45 years accounted for 72.1 per cent of victims during 2017 while people in working age group of 18 – 60 years accounted for a share of 87.2 per cent in the total road accident fatalities as per 'road accidents in India-2017' report by Ministry of road transport and highways, transport research wing [(2)]. The figures in national report and current study were highly comparable and thus authenticate the fact that fatal RTA victims largely constitute young people in the productive and working age groups which lead to loss of livelihood and have socio-economic implications too apart from the associated morbidity and mortality. Various other similar studies also observed comparable results [(5) (7)]. Road traffic injuries are the eighth leading cause of death for all age groups. More people now die as a result of road traffic injuries than from HIV/AIDS, tuberculosis or diarrheal diseases. Road traffic injuries are currently the leading cause of death for children and young adults aged 5–29 years, signaling a need for a shift in the current child and adolescent health agenda which, to date, has largely neglected road safety [(1)].

As per WHO report vulnerable road users – pedestrians, cyclists and motorcyclists – represent more than half of all global deaths. Pedestrians and cyclists represent 26% of all deaths, while those using motorized two- and three-wheelers comprise another 28% [(1)] amounting to a total of 54%. When compared with the present study vulnerable road users accounted for a total of 79% fatalities as shown in table II out of which pedestrian and cyclist comprised of 28% fatalities which is comparable to the global data. However global data for car user fatalities shown wide gap with global average of 29%, while our study shows 12% car occupant fatalities. The wide gap between vulnerable road user victims vis a vis car user may be as a result of socio-economic fabric of the country. However, the data of South East Asian countries is in coherence with our present study. According to WHO report of SE Asian region 4 wheeler fatalities amount to 16% (ours is 18%) while motorized 2 and 3 wheeler fatalities are 43% as per WHO and ours is 51% [(1)]. When comparing the road user category data with national report which shows the share of two-wheeler riders in total fatality has been highest 33% while pedestrian road-users comprise 13.8 per cent of persons killed in road accidents [(2)]. In the current study the same percentage was 51% and 22% respectively.

Another finding derived from the study was the causative factor involved on the accident cases studied. Road accidents are multi-causal and are the result of interplay of various factors which can broadly be categorized into human errors, road condition/environment and vehicular condition [(2)]. This finding is therefore susceptible to observer bias since the information collected is as per statements provided by the victim's side. As seen in chart II 4 wheeler vehicles, both heavy motor vehicles and light motor vehicles together constituted 72% of offending vehicle responsible for most accidents. In 22% cases there was no offending vehicle and driver was at fault with primary causes being skidding of vehicle, collision with trees or pavements and vehicle toppling over etc. Hence the above findings must not lead to a false notion that the bigger vehicle is always at fault but to a realization that only a multi dimensional approach towards the issue can address the problem. No similar data was available in the global report or the national report. This finding also highlights the vulnerability of road users where the size of vehicle does matters because in most of the cases the larger vehicle is held responsible for the mishap.

Further, we shall discuss the pattern and distribution of fatal injuries according to type of road user category. As we can observe in table III, head injury constitutes the single largest type of injury in almost all fatal cases with percentage ranging from 83% in case of bicycles and rickshaws to 33% in case of tractors. On average the ratio of head injury in vulnerable road users (two and 3 wheeler occupants; both motorized and non motorized and pedestrians) combined together amounts to around 73.4%. As per WHO report head injuries are the leading cause of death and major trauma for two- and three-wheeled motor vehicle users. Correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries [(1)]. Overall, victims on motorbikes were found most commonly to be suffering from poly-trauma. Pedestrians were the second most vulnerable group among various road user categories.

Another important finding of the study, as seen in chart III was that 3/4th or 75% of the total victims did not survive beyond 24 hours. Multiple studies have repeatedly established this fact [(8) (9) (10)]. Response by bystanders in this case is vital as many deaths are preventable if timely medical care is provided. The fact is important because the term “golden hour” is a well-known part of the lexicon of trauma surgeons and emergency medical service (EMS) providers who take care of injured patients on a daily basis. The underlying tenet is that an injured patient has 60 minutes from the time of injury to receive definitive care, after which morbidity and mortality increase significantly [(6)]. Landmark judgment by The Hon'ble Supreme Court in this regard in form of 'Good Samaritan law' is a step in the right direction [(11)]. The findings are alarming and necessitate establishment of a robust medical infrastructure to gradually provide early medical assistance to victims and improve survival rates of victims.

CONCLUSION:

In the end we must understand that road traffic injuries and subsequent fatalities cannot be avoided totally, however, multipronged strategy involving improving road infrastructure, strengthening automobile safety standards, generating awareness and a sense of responsibility among masses along with streamlined medical response and effective law enforcement will definitely result in reduction of morbidity and mortality associated with road side accidents and in making our roads

safer for all category of road users. The subject of road safety is an important one and the passage of Motor Vehicle (Amendment) Bill 2017 should be expedited [4] by the legislators in view of huge socio-economic implications of RTA's for country as a whole.

This paper attempts to analyze multiple factors involved in road accidents in the state of Haryana vis a vis various other similar studies and reports available and hopes that the results may be in some way help make our roads safer. A more detailed inter departmental clinical study can be undertaken in future studying the impact of safety measures used and their efficacy in reducing morbidity and mortality in trauma centre of the institute.

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