

ORIGINAL ARTICLE

Epidemiological profile of Road Traffic Accidents reporting at a Tertiary Care Hospital in Garhwal Region of Uttarakhand

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Abstract

Introduction: Accidents occur not only due to ignorance but also due to carelessness, thoughtlessness and over confidence. Human, vehicle and environmental factors play roles before, during and after a trauma event. Accidents, therefore, can best studied in terms of agent, host and environmental factors and epidemiologically classified into time, place and person distribution. **Objective:** To know the epidemiology of Road Traffic Injuries as seen in a Tertiary Care Hospital, Himalayan Hospital. **Methodology:** A cross-sectional study was done among patients of RTA admitted at a Tertiary Care Centre. A pretested semi-structured interview schedule was used to collect necessary information regarding the time, place and the person involved in the accident. Descriptive statistics for continuous variables and frequency, percentage for categorical variables were determined. **Results:** There was a marked male preponderance (83.24%) with maximum involvement of younger age groups. Most of the accidents had taken place in the evening hours (6 pm -12 midnight). Accidents were equally distributed throughout the year. **Conclusion:** Majority of the patients of RTI belonged to 21 to 30 years age group. Males outnumbered females victims.

Key Words

Road Traffic Accidents; Epidemiology; Vehicle

Introduction

Road Traffic Accidents (RTAs) are a significant public health challenge and projected to be the fifth leading contributor to the global burden of disease by 2030 (1). Accident represents a major epidemic of non-communicable disease in the present century. World Health Organization has defined accidents as “an unpremeditated event resulting in recognizable damage” (2). Road Traffic Accidents (RTA) are ‘hidden epidemic’ which though a priority has received much less attention (3). The epidemics of road traffic accidents are leading cause of mortality and morbidity. The alarming increase in mortality and morbidity owing to road traffic accidents has

been a matter of great concern globally (4). Advances made in health & health related sciences have paid with dividends in bringing down the mortality and morbidity due to communicable diseases. This has resulted in longevity of the people. At the same time Globalization has improved the socio economic status of the people resulting in changes in the lifestyle of the people. The longevity of life and changes in the life styles has brought the entire spectrum of non-communicable disease and accidents to the forefront of health care delivery system (5). Accidents have their own natural history and follow the same epidemiological pattern as any other disease - that is, the agent, the host and the environment interacting together to produce injury

or damage. They occur more frequently in certain age-groups, at certain times of day and week and at certain localities. Accidents, therefore, can be studied in terms of agent, host and environmental factors and epidemiologically classified into time, place and person distribution. Some people are more prone to accidents than others and susceptibility is increased by the effect of alcohol and other drugs as well as physiological state such as fatigue (6). From Uttarakhand's perspective, the geographical complexity of the region appears to make it a place of special interest. The Garhwal region of Uttarakhand is a difficult hilly terrain with poor geographical and climatic conditions thus making it prone for Road Traffic Accidents (RTA). Roadway connectivity of inter-districts and their blocks are also not good. The deep rooting of RTA in this region has few additional factors such as the difficult terrain, frequent tourism, and lack of good quality roads, frequent landslides, drunken driving, high speed, sleep & use of mobile phones while driving. In addition, during winters the cause of many accidents is fog, especially in this region, which diminished the visibility and hamper driving. All this continues despite of its existence as a decade old state. In addition to it, Garhwal region being a tourist & religious destination has only few epidemiological published studies on RTA. Keeping in view, the above factors it was considered worthwhile to have a retrospective hospital-based analysis of Road Traffic Accident cases sustained by the inhabitants and tourists in order to know the actual burden and its consequences so that further planning in terms of preventive measures, as well as management protocol, can be improved accordingly.

Aims & Objectives

1. To estimate the burden of Road Traffic Accidents (RTA) cases reporting to HIHT hospital over a 5 year period
2. To determine the age & gender of RTA victims.
3. To find out the distribution of RTA victims by Year, Time & Season of occurrence

Material and Methods

The present study was carried out at Himalayan Institute of Medical Sciences, Jolly Grant, Dehradun which is a tertiary care hospital and popularly known as HIHT Hospital. Ethical clearance was obtained from the Institutional Ethical Committee of HIMS, prior to the conduction of the study. The present study is a retrospective record based cross sectional

study. The data was collected via medical records of all RTA victims reporting to the Emergency Department of HIHT Hospital over a five year period i.e., between 1st January 2009 to 31st December 2013. For the purpose of the study a Road Traffic Accident (RTA) was defined as an accident which took place on the road between two or more objects, one of which must be any kind of a moving vehicle. The inclusion criteria was patients of all ages reporting to casualty of HIHT Hospital due to road traffic accidents. The exclusion criteria was an injury on road without involvement of the vehicle (e.g. person slipping or/and falling on the road and sustaining injury), an injury involving a stationary vehicle (e.g. Person getting injured while washing, cleaning and loading a vehicle) & cases with greater than 20% of missing data. A pre-tested proforma specially designed for this purpose was used for collection of data. It was pretested in a pilot study and minor modifications were made. The results of the pilot study were not included in the main study. This proforma was then used to collect data on the socio-demographic profile of the RTA victims, time, place and days, months of accident, details of circumstances leading to accidents. Thus there were a total of 3431 RTA cases who were studied from the case records of the medical records section after obtaining prior permission from the Medical Superintendent of HIHT Hospital. The obtained data was entered into Microsoft excel, double checked for errors and analyzed using Microsoft Excel 2007 and SPSS version 22.0. Interpretation of the collected data was done by using appropriate statistical methods like percentages & proportions.

Results

A total of 3431 victims were involved in RTAs, based on the information collected from Medical Record Section (MRD) of HIMS during the study period. Males comprised of total 2856 i.e. 83.2% of the total RTA victims whereas only one sixth of the total cases (575) i.e. 16.8% were females ([Figure 1](#))

[Table 1](#) depicts that maximum no of victims (82.7%) were from 11- 50 years with the highest proportion in 21-30 years (33.6%). Same pattern was observed in both sexes. Year wise distribution of RTA cases shows that no of accidents were rising with in the recent years i.e. 16.1% in 2009 & 26.6% in 2013, exception being 2010, in which a slight fall in proportion was observed (9.4%). ([Figure 2](#)-doughnut diagram).

On observing the RTA victims according to the time of occurrence it was noted that (Figure 3) majority of accidents (76.8%) had occurred during day time i.e. from morning to evening with a peak in afternoon (31.1%). There was no obvious seasonal variation seen among RTA victims as they were almost equally distributed in all seasons throughout the year (Table 2).

Discussion

Analysis of data gathered during the present study shows that there has been a gradual increase in the number of road traffic accidents during the past few years which may further add on in the coming years because of the large number of new vehicles in addition to absence of legislations and safe roads and this goes well with Kopits and Cropper 2003, who have cited that projections indicate that, without new and sustained commitment to prevent such injuries, the situation will worsen with a projected increase in deaths of about 65% over the next 20 years (7). In our study, majority of the RTA victims were in the age group of 21-30 years in both the sexes. Our findings are in consistent with other studies (8-10) which also shows that injuries occur in more productive age group as they are more vulnerable to injury due to their active life style & more involvement in outdoor activities. In addition, this group shows scarce attention to traffic rules & regulation and minimal use of safety devices like helmets, seatbelts etc. Further, inbuilt inherent tendencies of youth, burden of responsibilities, stress, type A' behavioral personality, etc contribute to the age specificity. It is seen that most of the bikers, particularly the young adults drive at high speed without wearing safety helmet. Similar observations were also reported by WHO in The Injury Chart Book, thereby indicating that the people in the productive age groups are most commonly involved in road traffic accidents, incurring serious loss to the country's productivity and economy. In our study, majority of the victims were males (11). This observation was supported by the previous studies by Ganveer *et al*, Ngo Anhetal, Dovom *et al*, Mohammad *et al*, Thomas *et al* (12-16) where all the researchers had observed remarkable difference in the gender variation in the victims of road traffic accidents. The fact that males are at higher risk of RTA than women can be attributed to their greater exposure to traffic and more risky behavior (than females) such as hanging on the side of bus, running

to catch a bus, aggressive driving, impatience, lack of attention and alcohol consumption prior to driving. In addition, since males are the breadwinner of house and often work outside, they are more vulnerable to injury and this could be due to the drivers and motor cyclist and even bicycles exclusively for males in our Indian culture, in addition, the males tend to move speedily. This was due to the obvious reasons like male dominance in job performance, lower literacy, family norms, cultural aspects etc, where the females are mostly confined to the residential place alone. This gender difference could probably be related to both increased exposure and risk taking behavior of males. Analyzing the time of RTA, it was found that, incidents were highest within the time zone of 12:00-08:00pm. Our results probably stem from the fact that these are the time periods when there is high human and traffic congestion on roads. These hours are the busiest as there is heavy rush of commuters from schools, offices, factories, business places, etc. Other studies by Thomas *et al*, Goswami *et al*, Khajuria *et al* also share the same views (16-18). In our study, cases of RTA were distributed equally throughout the year. This may be due to the fact that Uttarakhand being a tourist & religious pilgrim's destination, the roads are crowded throughout the year thus making it prone for Road Traffic Accidents in addition to the poor geographical & climatic conditions as landslides, steep curves etc. There are no train network in the hilly regions of Uttarakhand, consequently the tourists & pilgrimage attendees have no other option than to travel by road in either personal vehicles or public transport. Moreover, the influx of both these groups of travelers into various cities of Uttarakhand remains throughout the year because of the habit of people (in their busy modern life) of combining tourism with pilgrimage in one family unit i.e. the elderlies are more interested in pilgrimage whereas younger generation is attracted towards tourist places. This leads to hiring of bigger vehicles which are unsuitable for narrow tortuous roads of Uttarakhand involving frequent twists & turns. The lack of expertise of drivers of these vehicles to drive on the hilly roads further complicates this problem.

Conclusion

This is only a tip of the iceberg of the major problem of RTA occurring in Uttarakhand state and more detailed prospective and in-depth studies are

required to go into minute details of RTA's in this region. The results thus obtained will be useful for the appropriate state authorities in implementing corrective measures to minimize this problem

Recommendation

It is recommended that a community based campaign should be carried out to generate awareness among the common masses about safe driving habits and the need to follow the basic traffic rules while driving. There should be at least one hour devoted to Road Safety in the MBBS teaching curriculum also.

Limitation of the study

Being a retrospective study, it has its own limitations of depending on the data provided by case records of RTA victims and the latter cannot be cross-questioned to ascertain the details of other important aspects which led to the RTA.

Relevance of the study

The study would be relevant to the Road Transport Authorities, Govt. of Uttarakhand for making appropriate corrections and interventions in the factors highlighted for causing RTA in this region.

Authors Contribution

SDK: Conceptualization, study design, execution, data analysis, writing manuscript, report writing, submission and correspondence. SV: Participated in study conceptualization, research design, data collection & analysis, review of the data analysis reports. DS: Participated in study conceptualization, research design, data collection & analysis, review of the data analysis reports. JS: Participated in study conceptualization, research design, review and suggestions on the manuscript.

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Tables

TABLE 1 AGE & GENDER WISE DISTRIBUTION OF RTA VICTIMS

Age	Gender		Total
	Male	Female	
1-10yrs	96 (3.4)	54 (9.4)	150 (4.4)
11-20yrs	483 (16.9)	74 (12.9)	557 (16.3)
21-30yrs	1007 (35.3)	146 (25.4)	1153 (33.6)
31-40yrs	565 (19.8)	105 (18.3)	670 (19.5)
41-50yrs	367 (12.8)	91 (15.8)	458 (13.3)
51-60yrs	209 (7.3)	65 (11.3)	274 (7.9)
61-70yrs	96 (3.4)	33 (5.7)	129 (3.8)
>70yrs	33 (1.1)	7 (1.2)	40 (1.2)
Total	2856	575	3431

TABLE 2 DISTRIBUTION OF RTA VICTIMS ACCORDING TO SEASON OF OCCURRENCE

Age	Gender		Total
	Male	Female	
Winter(Dec-Feb)	691 (24.2)	145 (25.2)	836 (24.4)
Spring(March-May)	812 (28.4)	165 (28.7)	977 (28.5)
Summer(June-August)	714 (25.0)	145 (25.2)	859 (25.0)
Autumn(Sep-Nov)	639 (22.4)	120 (20.9)	759 (22.1)
Total	2856	575	3431

Figures

FIGURE 1 GENDER WISE DISTRIBUTION OF RTA

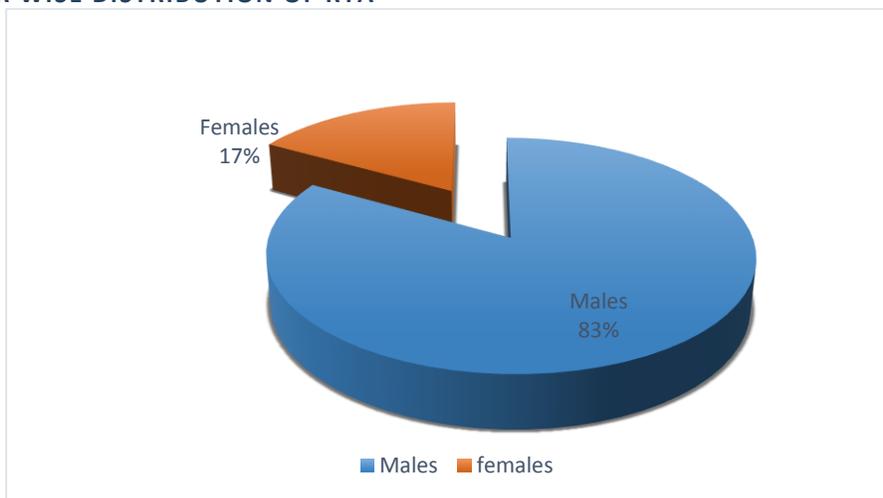


FIGURE 2 YEAR WISE DISTRIBUTION OF RTA VICTIMS

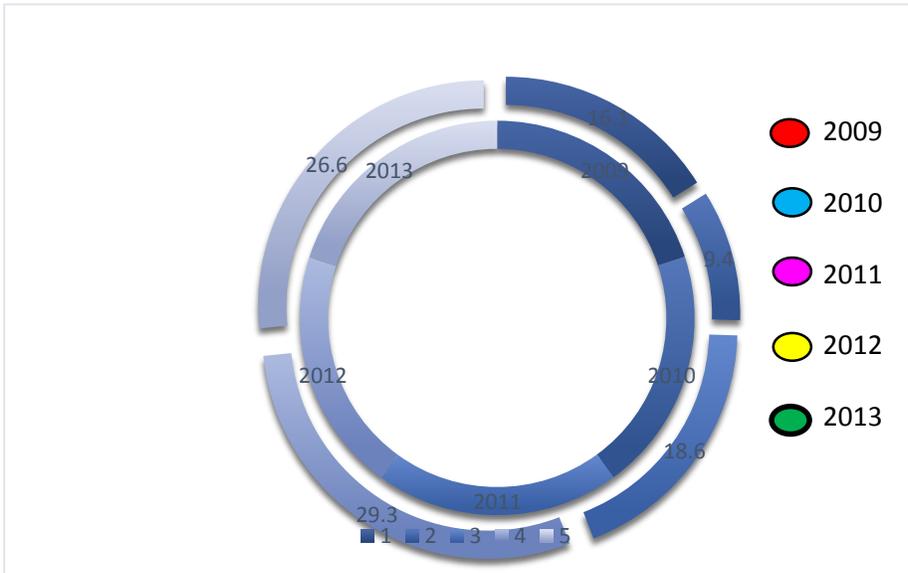


FIGURE 3 DISTRIBUTION OF RTA CASES ACCORDING TO TIME OF OCCURENCE

