

CLINICO- EPIDEMIOLOGICAL PROFILE OF ROAD TRAFFIC INCIDENTS ADMITTED AT A TERTIARY CARE HOSPITAL IN GARHWAL-UTTARAKHAND

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ABSTRACT:

BACKGROUND: The magnitude of Road traffic incidents and fatalities in India is alarming. In 2009, 4.22 lakh road traffic incidents and 1.27 lakh road traffic fatalities were reported. These numbers translate into one road accident every minute and one road accident death every four minutes

METHODS: The study (based on Jorgensen and Abane model, 1999) was conducted over a period of one year during April 2011 to March 2012, among 136 victims (including 33 drivers) of road traffic incidents coming to Veer Chandra Singh Garhwali government medical college, Srinagar, Garhwal. **RESULTS:** 136 victims including 33 drivers were interviewed who were brought to the causality in the aforesaid period. 23 people were brought dead. There is clustering of cases from the month of August to October when compared to other months of year. 40% of drivers were drunk/or using some other substance at the time of accident. Only 12.1% of drivers were using seat belts at the time of accident. 57.6% were having driving license and 54.5% were either refractive error or hearing impairment or both. Human error, High speed, Lack of sleep, effect of Alcohol and mechanical fault of vehicle were reasons of accident as told by the drivers **CONCLUSIONS:** During August to October there is clustering of cases. This period coincides with “Char Dham Yatra” and rainy season both. Special efforts should be done during this period. Strong vigilance of drivers for

alcohol use, presence of driving license, compulsory use of seat belts, and premedical checkup for refractive errors may prove valuable and morbidity and mortality can be minimized.

KEY WORDS: Road Traffic Incident, Determinants, Hilly region

INTRODUCTION:

Road traffic incidents which are generally unintended and preventable are a common risk every day to life that can happen to almost every one, anywhere. The problem of road traffic incident is increasingly becoming a threat to public health and national development in many developing countries. Road traffic incidents contribute to poverty by causing deaths, injuries, disabilities, grief, lost of productivity and material damages. Road traffic incidents are the most frequent causes of injury-related deaths world wide¹. According to the World Report on Road Traffic Injury Prevention² traffic accidents account for about 3000 daily fatalities worldwide. Statistical projections show that during the period between 2000 and 2020, fatalities related to traffic incidents will decrease with about 30% in high income countries. The opposite pattern is expected in developing countries, where traffic accidents are expected to increase at a fast rate in the years to come. In developing countries the trend has reached an alarming state, but very little attention is paid to the problem³. There is evidence that using minimum safety standards, crash worthiness improvement in vehicles, seatbelts use laws and reduced alcohol use can substantially reduce deaths on the road⁴. The magnitude of Road traffic incidents and fatalities in India is alarming. In 2009, 4.22 lakh road traffic incidents and 1.27 lakh road traffic fatalities were reported⁵. These numbers translate into one road incident every minute and one road incident death every four minutes. However, this is an underestimate, as not all injuries are reported to the police⁵. Hilly regions are prone for RTA and there are very few number of studies in such areas. Therefore this study is under taken to identify the clinic – epidemiological profile of Road traffic incidents amongst patients admitted at Base hospital, Srinagar - Garhwal and to assess the factors associated with the causation of the same.

METHODOLOGY:

A model for traffic incident as inspired by the ecological model of a disease was developed by Jorgensen and Abane (1999)⁶ who made a heuristic adjustment of this basic model to suit road traffic accident analysis. The model is characterized by three main components:

1. The vehicle (corresponding to the vector in disease ecology) which describes vehicles into its composition, age, technical conditions and safety equipments like seat belts in a car.
2. The environment, comprising the road system and the wider physical and built up environment. The physical environment splits further into different aspects such as; Daylight and climate (weather conditions and road conditions), Spatial conditions (arrangements and Macro structures), Settlement pattern (Urban or rural / sparse or populated area), situation of areas of residence and working areas, Principle of traffic separation, topography and road constructions qualities.
3. The behavior of the population; including its characteristics such as age and sex ratio as well as attitudes and general traffic behavior. And it goes further into driving behavior, driving experience, driving style, risk compensation and risk driving (influence of alcohol and drugs).

Superimposed on this model is a system of traffic laws, regulations and mode of enforcement designed to ensure that the population adheres to the controls and regulations so as to maintain some level of road safety i.e. traffic rules (speed restrictions, road signs), speed controls and convictions for various road traffic offences⁶. Based on this model this cross sectional study was done with the help a pretested questionnaire, in a tertiary care hospital in Garhwal. All cases of RTA coming to the tertiary care hospital during March 2011 to February 2012 were included in the study. Questions were asked for assessing various risk factors as per the above said model and data entry was done on excel and analyzed thereafter.

ETHICAL CONSIDERATIONS:

Ethical clearance from institutional review board/ institutional ethical committee was taken for the study. Written consent was sought from the all respondents. They were informed about the nature and the purpose of the survey.

RESULTS:

During the study period a total of 136 individuals came for the medical assistance (Figure-1). 117 were males 19 were females. Out of them 33 were drivers of the vehicle, which got the accident. The number of brought dead persons because of Road Traffic Incidents, in the aforesaid period was 23. Out of the brought dead individuals 5 were drivers of the vehicle. Maximum number of morbidity because of RTI is evident in the month of December. There is clustering of cases from the month of August to October when compared to other months of year (Figure-1).

Most of the drivers were literate. Out of 33 drivers interviewed only 3 (9%) were illiterate. Nearly 40% of drivers were drunk/or using some other substance at the time of accident. 50% of drivers were >40 years of age. 15.8% of drivers were less than 20 years of age. Most of the drivers (51.5%) who met the accident were having driving experience of >5 years. 12.1% of drivers were having driving experience of less than 1 year. Only 12.1% of drivers were using seat belts at the time of incident. 57.6% were having driving license and 54.5% were either refractive error or hearing impairment or both. Most of the respondents told that it was mistake of other drivers which led to the accident. High speed, Lack of sleep, effect of Alcohol and mechanical fault of vehicle were other reasons of accident as told by the drivers (Table-2). 78% of victims were brought to the hospital with help of 108 helpline service. Rest 22 % were came either by themselves or by other people (Figure-1).

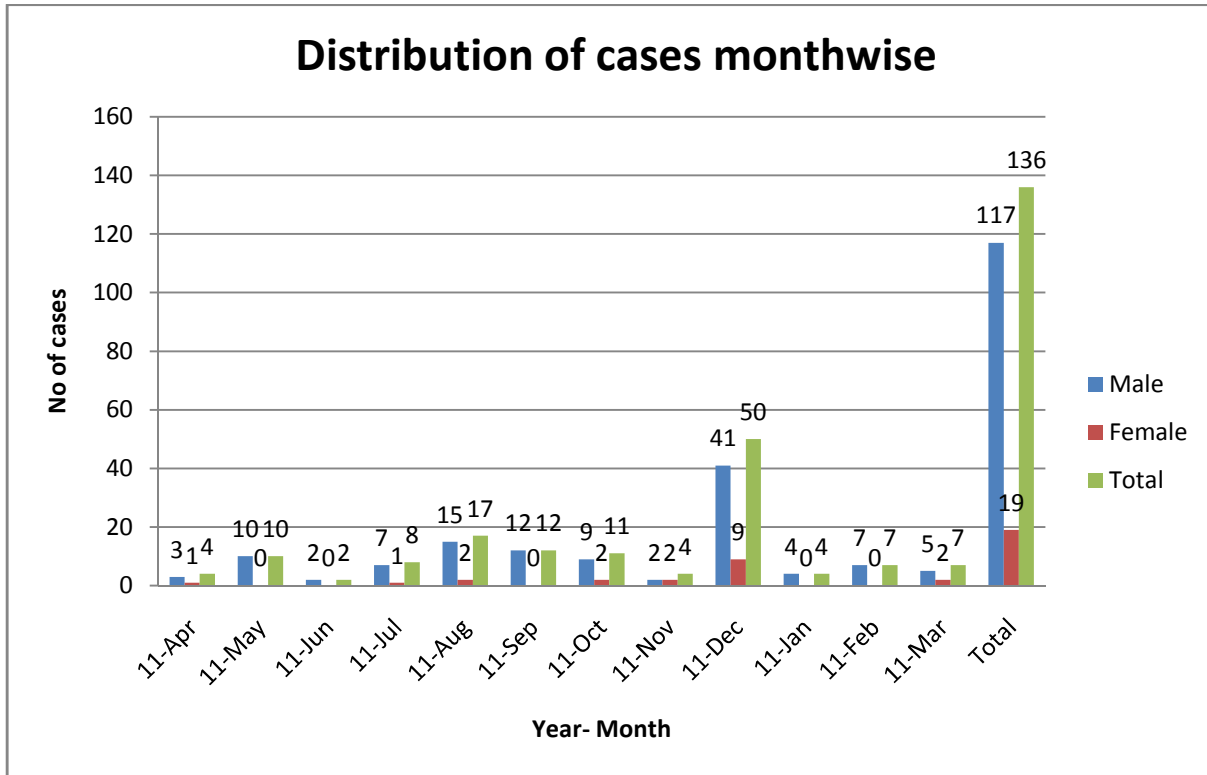
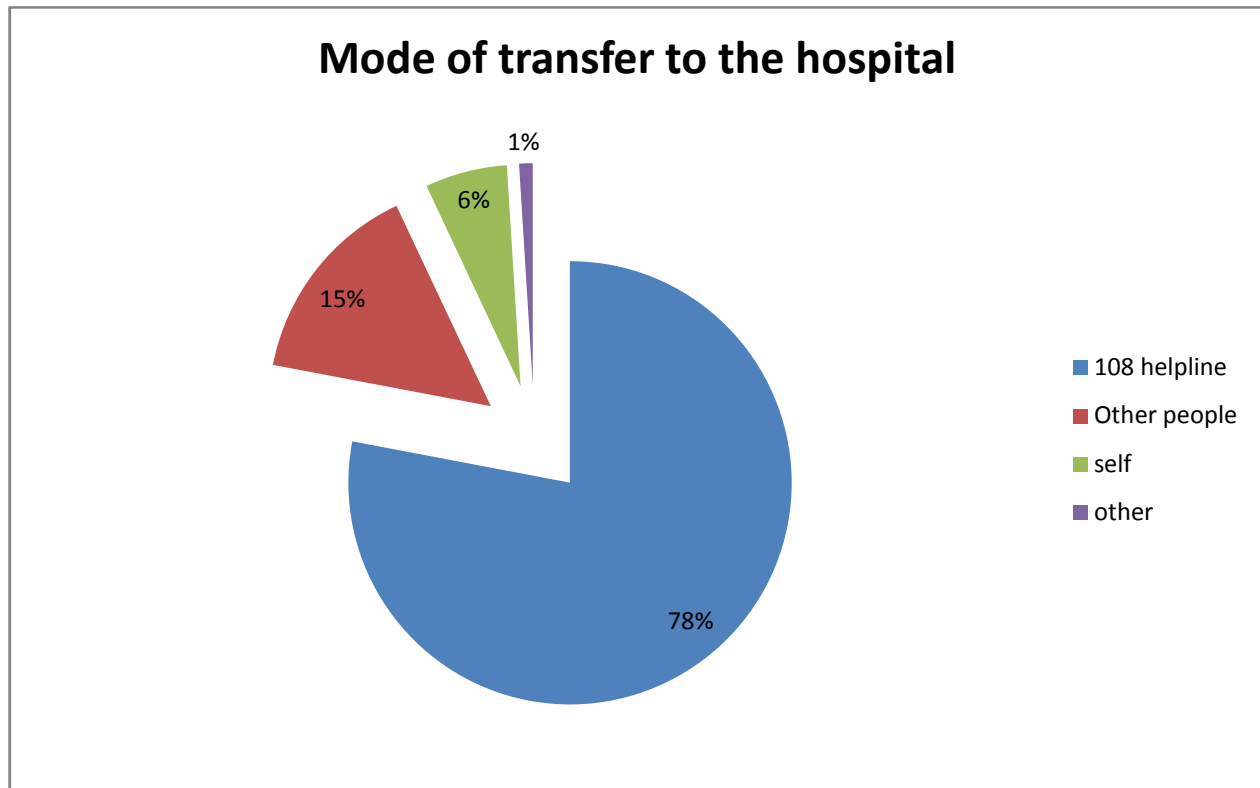


Figure -1: Monthly distribution of RTI cases

Figure-2: Mode of transfer to the hospital



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Table-1: Clinico-epidemiological profile of RTI cases

Drivers interviewed		Yes	% age
Education(n=33)	Illiterate	03	9.1
	Up to 5th std	13	39.4
	5-12 th std	16	48.4
	Graduate/Post graduate	01	3.1
Age(n=38, Including the brought dead drivers)	<20 years	6	15.8
	20-40 years	13	34.2
	>40 years	19	50
Alcohol /other substance use at the time of accident(n=33)		13	39.4
Driving experience (n=33)	<1 year	4	12.1
	1-5 years	12	36.4
	>5 years	17	51.5
Seat belt use(n=33)		4	12.1
Driving license(n=33)		19	57.6
Refractive error /Hearing impairment / both(n=33)		18	54.5
Cause as told by driver(Multiple answers could be given)	Mistake of others/Human error*(n=33)	23	69.7
	More speed	14	42.4
	Lack of sleep	11	33.3
	Alcohol use	09	27.3
	Mechanical fault of the vehicle**	09	27.3
	Others including environmental conditions	04	12.1

**Human error: wrongful U-turn by other vehicle , Wrongful overtaking by un-coming vehicle*

***Mechanical fault: break failure, burst tyre, and locked steering mechanism*

Maximum number (47.8%) of RTI morbidity was because of polytrauma associated. And upper limb injury was least responsible for the mortality.50% of accidents took place in the evening

hours. 72.7% of vehicles were older than 5 years of age. Fall from hill was the mode of accident in most of the cases and the mortality and severe injuries were also more in fall from hillside, followed by accident from the sides and head on collision.

Table -2: Epidemiological profile of RTI cases

Variable		Number	% age
Injury(n=136)	Involved head	20	14.7
	Upper limb	14	10.3
	Lower limb	21	15.5
	Abdomen	16	11.7
	Multiple / polytrauma	65	47.8
Time of accident(N=38)	12pm -6 pm	14	36.8
	6pm-9pm	19	50.0
	9pm-6am	02	5.3
	6am- 12 pm	03	7.9
Age of the vehicle(N=33)	<5 years	09	27.3
	>5 years	24	72.7
Type of collision/accident(N=38)	Head on	04	10.5
	From behind	02	5.3
	From sides	07	18.4
	Fall from hill	18	47.4
	Other	07	18.4

DISCUSSION:

Maximum number of Morbidity because of RTI is evident in the month of December. It was fall of a bus, from the hill side leading to higher toll in mortality and morbidity in month of December. There is clustering of cases from the month of August to October when compared to other months of year. "Char dham yatra" which lead to sudden increase in number of vehicles on hillside and heavy rainy season both coincides with this period. These can be contributing factor for such clustering of cases. Most of the drivers were literate. Out of 33 drivers interviewed only 3 (9%) were illiterate. Substance use including drinking behavior was noticed in 39% of the drivers at the

time of accident. Experienced drivers (>5 years) met the accident in maximum number. Overconfidence leading to recklessness can be the reasons for such happening. 77.9% drivers were not using seat belt at the time of accident and when asked for the driving license only 42.4% could not produce the same. 50% of drivers who met the accident were >40 years of age. In the elderly visual impairment prevents adequate visual function, which may be responsible for the accident. When examined, 54.5% were having either refractive error or hearing impairment or both. A study, which examined the association between visual impairment and RTI among 1,428 drivers seen at the accident and emergency department of a hospital in the United Arab Emirates, also identified visual impairment to be significant risk factors⁷. Likewise Davidson in his examination of the interrelationship between British drivers' visual abilities, age and RTI histories found strongest positive association between RTI variables and visual disabilities, among older drivers⁸. Most of the respondents told that it was mistake of other drivers which led to the accident. High speed, Lack of sleep, effect of Alcohol and mechanical fault of vehicle were other reasons of accident as told by the drivers. Study by Asogwa et al⁹ showed that commercial drivers drive for hours without sleep and food, until fatigue inevitably sets in and a crash may be the end result. Effect of alcohol or other substances was also substantiated by Lemoine et al¹⁰. Maximum number (47.8%) of RTI morbidity was because of polytrauma associated. And upper limb injury was least responsible for the mortality. This is in contrast to the study by Biswas G¹¹ who cited that the maximum (56.4%) injuries were found on head and neck, followed by thorax (54.5%) and abdomen (44.5%). Other studies^{12,13} also showed a high incidence of head injuries in their studies. 50% of accidents took place in the evening hours. Fall from hill was the mode of accident in most of the cases and the mortality and severe injuries were also maximum in such mode of accident followed by accident from the sides and head on collision.

CONCLUSION:

During "Char Dham Yatra" period and rainy seasons there is clustering of cases. Special efforts should be done during this period. Strong vigilance of drivers for alcohol use, presence of driving license, compulsory use of seat belts, premedical checkup for refractive errors, must be ensured. The role of 108 helpline¹⁴ cannot be ruled out and strengthening of this service can be of paramount importance. All These measures may prove valuable and morbidity and mortality can be minimized.

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