

An epidemiological study of road traffic accident cases attending a tertiary care hospital, Tirupati

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Abstract:

Introduction: Globalization has resulted in motorization pacing up the number of road traffic accidents, thereby affecting the families, community and nations as a whole. In 2010, the WHO member countries declared 2011–2020 as the Decade of Action for Road Safety, to stabilize and reduce the increasing trend in road traffic fatalities.

Objectives: To know the socio-demographic profile of RTA cases attending SVRRGGH, Tirupati. To study the frequency of occurrence of RTA by month, day & time and to identify the type of road users and their mode of RTA.

Methodology: A hospital based, cross sectional study with victims of road traffic accidents as study subjects was conducted for a period of one year from June 2013 to May 2014 at S.V.R.R. Government General Hospital, Tirupati, India. 820 cases of road traffic accidents were interviewed after taking prior consent using a predesigned questionnaire.

Results: 63.8% cases were less than 40 years of age and 85.0% of the subjects were males. 44.1% and 77.7% of the respondents belong to upper lower socioeconomic status and rural areas respectively. Approximately half of the RTAs happened on weekends and most (35.3%) of the RTAs occurred between 6PM and 10PM. Motorcyclists (54.3%) were the leading road users among victims. Majority of cases were stuck by a light motor vehicle (20.9%) followed by self-fall (20.3%).

Key words: Globalization, Population explosion, Road traffic accident, Road user, Sociodemographic profile

I. Introduction:

Population explosion and increased use of motor vehicles has led to rise in the number of road related accidents, road accident injuries and fatalities. As a result, road traffic accidents stand as one of the leading causes of mortality and morbidity across the globe. Approximately 1.24 million people die every year on the roads across the world, and another 20 to 50 million sustain nonfatal injuries as a result of road traffic accidents. These injuries and deaths have an immeasurable impact on the families affected whose lives are often changed irrevocably by these tragedies, and on the communities in which these people lived and worked. Eighty per cent of road traffic deaths occur in middle socio-economic countries, which account for 72% of the world's population, but only 52% of the world's registered vehicles.¹ The reasons for the high burden of road traffic injuries in developing countries are increase in the number of motor vehicles, poor enforcement of traffic safety regulations, inadequacy of health infrastructure, and poor transport facility.²

In 2010, the WHO member countries declared 2011–2020 as the **Decade of Action for Road Safety**. In this connection World Health Organization prepared a report on global road safety and made effort to monitor progress over the period of the decade. The goal of the decade (2011–2020) is to stabilize and reduce the increasing trend in road traffic fatalities, saving an estimated 5 million lives during 2011-2020.¹ Various studies^{3,4,5} conducted globally have proved that the productivity costs far outweigh the direct costs and further the cost estimates based on only direct costs, particularly only medical costs, can be grossly inadequate.

Sri Venkateswara Ramnarayan Ruya Government General Hospital (SVRRGGH) is a tertiary care hospital of the government of Andhra Pradesh at Tirupati. It plays a major role as a government referral centre in Chittoor district. Victims of road traffic accidents in both rural and urban areas who require tertiary care are referred to SVRRGGH, Tirupati, hence a study on road traffic accidents is required at this place.

II. Objectives:

- 1) To know the socio-demographic profile of RTA cases attending SVRRGGH, Tirupati
- 2) To study the frequency of occurrence of RTA by month, day and time
- 3) To identify the type of road users and their mode of RTA.

III. Methodology:

The present study was a hospital based, cross sectional study with victims of road traffic accidents admitted in S.V.R.R. Government General Hospital, Tirupati as study subjects. All road traffic accident cases admitted for at least more than 24 hours were included into the study. Exclusion criteria include victims of road traffic accidents admitted for less than 24 hours, Cases treated on outpatient basis and not admitted into hospital, Victims who were immediately referred to higher centre, In case of unconscious patient & if the family members are not willing to participate, Cases not willing to participate in the study. Study was conducted at departments of Emergency, Surgery, Orthopedic and Neurosurgery at S.V.R.R. Government General Hospital, Tirupati for a period of one year from June 2013 to May 2014 after obtaining approval from institutional ethical committee. A pilot study was conducted for a period of one month during May 2013 by using a pre-designed questionnaire and necessary corrections were made.

A total of 820 cases of road traffic accidents reported to the Emergency, Surgery, Orthopedic and Neurosurgery units of S.V.R.R. Government General Hospital at Tirupati were interviewed after taking prior consent using a predesigned questionnaire. In case if patient is not in a situation to respond, information was collected from family members, relatives, or friends. Data was entered into MS excel and analyzed using Epi-infoTM 7.1.3.10 version software and appropriate statistical tests of significance were employed like Chi-Square test for significance of difference in proportions.

IV. Results:

Table 1: Age group, gender and religion of subjects (N=820)

S.No.	Variable	Number of subjects	Percentage
1.	Age group (Years)		
	Less than 20	94	11.5
	20 – 29	222	27.0
	30 – 39	216	26.3
	40 – 49	140	17.1
	50 – 59	81	9.9
2.	Gender		
	Male	697	85.0
	Female	123	15.0
3.	Religion		
	Hindu	715	87.2
	Muslim	60	7.3
	Christian	44	5.4
	Others	1	0.1
4.	Marital status		
	Married	563	68.7
	Unmarried	192	23.4
	Widowed/Divorced	65	7.9
5	Educational status		
	Illiterate	183	22.3
	Primary	145	17.7
	Secondary	279	34.0
	Intermediate	143	17.5
	Degree	38	4.7
	Postgraduate	17	2.0
	NA	15	1.8
6	Occupational status		
	Unemployed	24	2.9
	Student	129	15.7
	Unskilled	110	13.4
	Semiskilled	258	31.5
	Skilled	107	13.0
	Semi-Professional	20	2.4
	Professional	48	5.9
	Housewife	112	13.7
	Retired	5	0.6
	NA	7	0.9
	7	Socio economic status	
Upper		52	6.3
Upper Middle		85	10.4
Lower Middle		164	20.0
Upper Lower		362	44.1
Lower		157	19.2
8	Place of residence		
	Rural	637	77.7
	Urban	183	22.3

The informant in the majority of the cases was found to be the person himself / herself (70.1%) followed by family members (25.5%) and friends (3.6%). By age group, 27.0% of the subjects belong to 20-29 years followed by 30-39 years (26.3%). It was found that the age of the subjects was less than 40 years in 63.8% cases. A large majority of the subjects was males (85.0%) and Hindus by religion (87.2%) and married (68.7%). Majority of the subjects were secondary literates (34%) followed by illiterates (22.3%). Majority of the subjects were semi-skilled by occupation (31.5%) followed by students (15.7%). It was found that majority of the subjects belonged to upper lower socio-economic status (44.1%) followed by lower middle economic status (20.0%). Further, it was found that a large majority of them belonged to rural areas (77.7%).

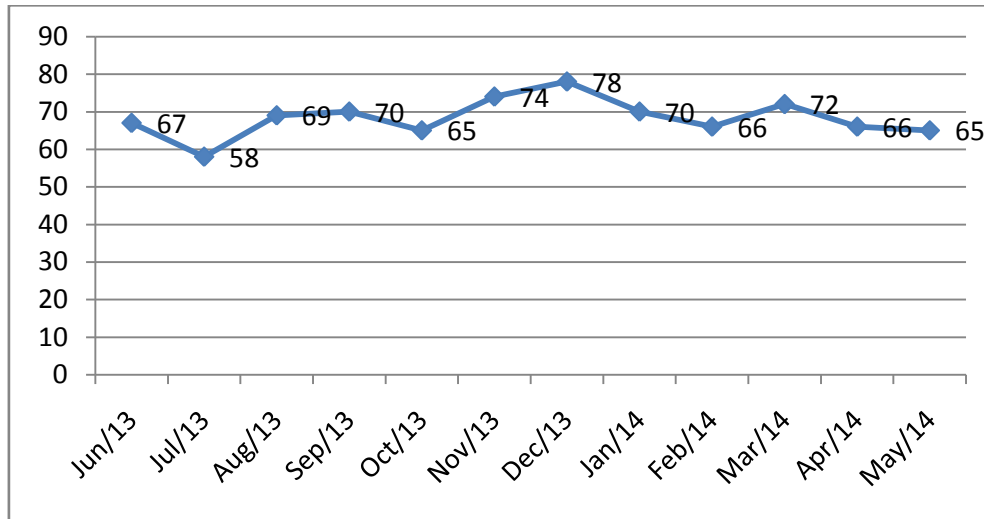


Figure 1: Number of RTA cases in various months

A slightly higher proportion of accident cases was reported in the month of December (9.5%) followed by November (9.0%). It can however be found that more or less the proportion of accidents remained within narrow limits of 7.1% to 9.5%.

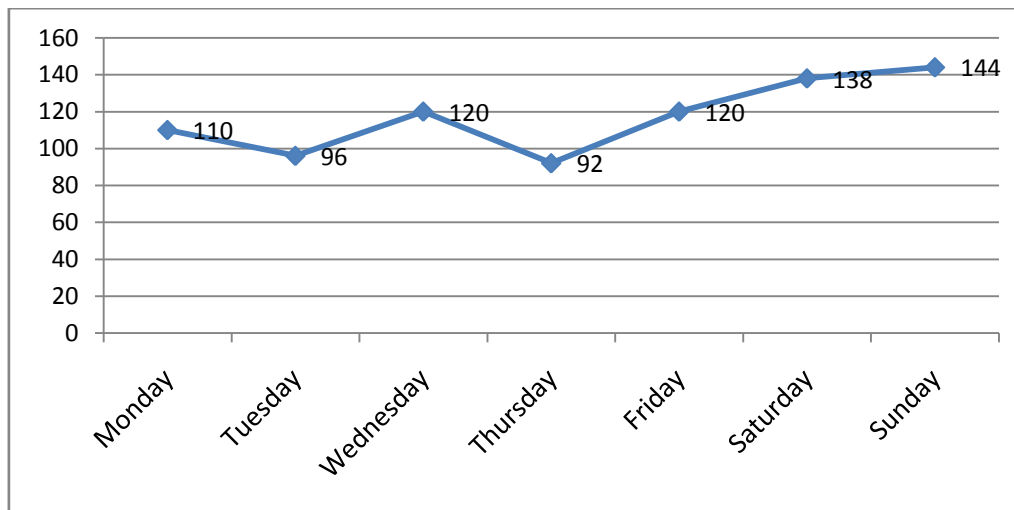


Figure 2: Number of road traffic accidents by day of the week

Highest proportion of accident cases was reported on Sunday (17.7%) followed by Saturday (16.8%) and Friday (14.6%). Thus in the weekends (from Friday to Sunday), the proportion of accidents was found to be as high as 49.1%.

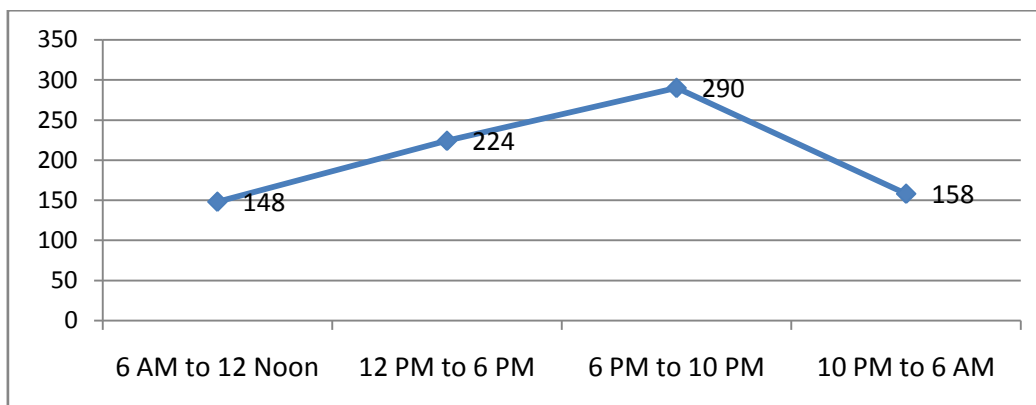


Figure 3: Number of road traffic accidents by time period of the day

Regarding time period in a day, the proportion of accident cases reported during 6 PM to 10 PM was highest (35.3%) followed by 12 PM to 6 PM time (27.3%). Further, the number of accident cases steadily increased from 6 AM to 10 PM and thereafter decreased during night-time between 10 PM to 6 AM.

Table 2: Type of road user among road traffic accident cases (N=820)

Type of road user	Number of cases	Percentage
Motorcycle	445	54.3
Pedestrian	164	20.0
Auto rickshaw	107	13.0
Light Motor Vehicle	54	6.6
Heavy Motor vehicle	23	2.8
Cyclist	17	2.1
Tractor	10	1.2
Total	820	100.0

In a large majority of the subjects, the type of road user was found to be motorcycle (54.3%) followed by pedestrian (20.0%).

Table 3: Mode of road traffic accident (N=820)

Mode of RTA	Number of cases	Percentage
Light Motor Vehicle hit	171	20.9
Self fall hit	167	20.3
Heavy Motor Vehicle hit	155	18.9
Motorcycle hit	102	12.4
Auto rickshaw hit	82	10.0
Fall from vehicle	52	6.3
Upside down of vehicle	44	5.4
Hit to tree	34	4.2
Unknown vehicle hit	13	1.6
Total	820	100.0

A majority of cases were stuck by a light motor vehicle (20.9%) followed by self fall (20.3%) and heavy motor vehicle (18.9%).

V. Discussion:

In the present study, most (27.0%) of the subjects belong to 20-29 years followed by 30-39 years (26.3%). Further it was found that the age of the subjects was less than 40 years in 63.8% cases. In a hospital based at Nagpur,⁶ majority (82%) of the victims were in the age group 18 to 37 years and 18% cases were aged more than 37 years. Whereas study done at Nepal,⁷ showed that injury was common in the age group of 40-49 years. A study from Tanzania⁸ concludes that the transport related injuries to be much common among adults, 15 years and above. The mean age in the present study was found to be 35.1 ± 14.7 years while it was 36.5 and 32.32 years in studies done at Chandigarh⁹ and Hyderabad¹⁰ respectively.

A large majority of the subjects were males (85.0%) in the present study. Similar observations were reported in studies done at Chandigarh⁹ and Bhopal¹¹ where male victims accounted for 84% and 82.5% respectively. Whereas in another study at Gujarat,¹² 22.7% of the road traffic accident victims were found to be females. Majority of the victims of RTA in the study were Hindus by religion (87.2%) followed by Muslims (7.3%) and Christians (5.4%). Study at Chandigarh⁹ found that most (67%) of RTA victims were belonged to Hindu religion followed by Sikhs (27%). In the present study majority (68.7%) of the subjects were married. In

the study conducted at NIMHANS, Bengaluru¹³ it was found that 50% of the RTA victims were married and concluded that most of them have family members who are dependent on the victims, which will further add to the economic burden. Most of the subjects were secondary literates (34%) followed by illiterates (22.3%). Similar results were observed in a study at Nepal.¹⁴ Whereas Fifty percent of the victims of RTA in a study at Kolkata¹⁵ were found to have low education levels.

Regarding occupation, majority of the subjects were semi-skilled by occupation (31.5%) followed by students (15.7%). While study at Chandigarh⁹ had shown that out of total injured persons students and unskilled workers accounted for 18% each. It was found that a majority of the subjects belonged to upper lower socio-economic status (44.1%) followed by lower middle economic status (20.0%). Whereas approximately 27% of the road accident cases belong to upper middle class in a study at Kolkata.¹⁵ While at Aligarh,¹⁶ 55% are from upper lower class. In the present study period of one year, it was found that slightly higher proportion of accident cases was reported in the month of December (9.5%) followed by November (9.0%). However in studies conducted at Delhi,^{17,18} it was found that the highest number of accidents was reported in January.

Highest proportion of accident cases was reported on Sunday (17.7%) followed by Saturday (16.8%), Friday and Wednesday (14.6%) in the present study. Most of the people especially young and productive age group is indulged in outdoor activities during weekends, which could be one of the reasons for the rise in the number of accidents in weekends. Study done in JIPMER at Pondicherry¹⁹ found that 17.1% of the injuries occurred on Sundays, 15.9% on Tuesdays followed by Thursdays. Likewise in a study conducted at Thailand,²⁰ it was found that more than 75% of the Road accidents were happened during weekends. In contrast, a study conducted at Delhi¹⁸ reported that highest RTAs occurred on Mondays and Wednesdays. In the present study it was found that highest proportion of accident cases was reported during 6 PM to 10 PM (35.3%) followed by 12 PM to 6 PM time (27.3%). In a study at Ambala²¹ had shown that most (40.15%) of the RTAs occurred in the evening hours from 6pm to 12 midnight.

Most of the subjects were using motorcycle (54.3%). 20% of the victims were pedestrians and 13.0% were using auto rickshaw. Tirupati being an urban city, usage of motorized vehicles will be more when compared to other means of transport. Study conducted at Gujarat¹² had shown that, Out of total 236 drivers/riders, maximum were 2 wheeler riders (75.0%) followed by 4 wheeler riders /drivers (10.59%) and bicyclists (10.59%). A large proportion of cases were hit by light motor vehicle (20.9%) followed by heavy motor vehicle (18.9%). In a study done at Haryana,²¹ it was revealed that 26.01%, 21.0% and 12.92% of the victims were hit by LMV, motorized two-wheeler and HMV respectively. Whereas a study conducted at Bengaluru¹³ disclosed that 41% were injured due to hit by a motorized two-wheeler, 15% by a car and 11% by three wheeled auto rickshaw.

VI. Conclusion and recommendations

Young and adult males, who are the breadwinner for the family constitute the majority of the population getting affected by road traffic accidents, Approximately two thirds of the victims of RTA's are from rural areas, where the roads are narrow and not maintained properly thereby requiring improvement in condition of the roads. Nearly half of the RTAs happened on weekends and most of the RTAs occurred between 6PM and 10PM, hence there is a need to sensitize public about the raise in road traffic accidents especially during weekends and in the peak hours of all week days and plan for travel accordingly. Further motorcyclists who are the leading road users among victims must be counseled regularly regarding the road safety measures. There is a need to increase the traffic police force and volunteers at heavy traffic points to control the traffic especially during weekends.

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