Original Research Article

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Study on risk factors of road traffic accident victims attending a tertiary care hospital at Tirupati

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ABSTRACT

Background: Road traffic accidents stand as one of the leading causes of mortality and morbidity across the globe. Increase in the number of motor vehicles, poor enforcement of traffic safety regulations, inadequacy of health infrastructure, and poor transport facilities makes the situation still worse. The objective of the study is to know the role of victims and various risk factors related to RTA. To determine the association of risk factors with type of injury and to know the pre-existing medical disorders in RTA victims.

Methods: 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 was done during June 2013 to May 2014 for one year where 820 victims of road traffic accidents were interviewed after taking prior consent using a predesigned questionnaire.

Results: Most of the victims were drivers (48.5%) followed by passengers (31.7%) and pedestrian (19.8%). No two wheeler driver was wearing helmet. 74% of the four wheeler occupants were not using seat belts. Among drivers and pedestrians, 29.2% were under the influence of alcohol and 12.7% were listening to music. 55.8% of the passengers felt that their vehicle was going with over speed. 17.1% & 11.0% of the participants had history of hypertension and

Conclusions: There is a need to develop integrated surveillance system to identify the road traffic injury burden and the causal/risk factors. Enforcement of stringent road traffic laws to bring down the burden of road traffic accidents.

Keywords: Road traffic accident, Driver, Passenger, Pedestrian

INTRODUCTION

Globalization has led to the expansion in the road network along with rise in motorization of vehicles. Simultaneous population explosion and rapidly increasing use of motor vehicles has led to rise in the number of road traffic related accidents, road accident injuries and fatalities. Thereby 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. 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. In South-East Asia Region during 2010, around 3.35 lakh people died from road traffic injuries with the road traffic death rate of 18.5 per 1 lakh population. Further the total number of registered

vehicles increased by 28% from 2009 to 2013. There is no comprehensive legislation on five key risk factors for road traffic injury which include speeding, drink-driving, use of motorcycle helmets, seat-belts and child restraints in any of the South-East Asia Region countries.²

Road traffic injures in developing counties mostly affect pedestrians, passengers and cyclists as opposed to drivers who are involved in most of the deaths and disabilities occurring in the developed world. 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. In India, 1.27 lakh people died in road accident during 2009 resulting a financial cost of approximately 1.36, lakh crore Indian rupees. Road traffic accidents can be easily compared with gigantic infamous tsunami. Road crashes deserve to be a strategic issue for any country's public health and can lead to overall growth crisis, if not addressed properly.

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. The objectives of the study include.

- 1. To know the role of victims in RTA.
- 2. To study various risk factors related to RTA.
- 3. To determine the association of risk factors with type of injury.
- 4. To know the pre-existing disorders in RTA victims.

METHODS

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 was done. 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.

RESULTS

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%).⁶

Table 1: Particulars of drivers as patients (N=398).

S.No	Particulars	Yes (%)	Total (%)
1.	Owner of the vehicle	259 (65.1)	398 (100.0)
2.	Had valid driving license	280 (70.3)	398 (100.0)
3.	Vehicle was in good condition	272 (68.3)	398 (100.0)
	Driving experience		
4.	Less than one year	39 (9.8)	398 (100.0)
5.	1 – 5 years	191 (48.0)	398 (100.0)
6.	6 – 10 years	129 (32.4)	398 (100.0)
7.	11 years & above	39 (9.8)	398 (100.0)

Table 2: Distribution of certain risk factors in drivers / pedestrians (N=560).

Particulars	Yes (%)	Total (%)
Under the influence of alcohol	116 (29.2)	560 (100.0)
Listening to music at the time of accident	71 (12.7)	560 (100.0)
Had some stress at the time of accident	53 (9.5)	560 (100.0)
Using mobile at the time of accident	38 (6.8)	560 (100.0)
Engaged in conversation at the time of accident	38 (6.8)	560 (100.0)
History of Road traffic accidents	35 (6.3)	560 (100.0)
Tobacco use	23 (4.1)	560 (100.0)
Fatigue	23 (4.1)	560 (100.0)

Table 3: Type of injury by certain risk factors in drivers & pedestrians (N=560).

S. No	Risk factor	Number with grievous injury	*Total number of patients with risk factor	Percentage	P value (based on Chi-square test)
1.	No Driver seat belt (N=20)	9	10	90.0	0.006; S
2.	History of RTA	20	35	57.1	0.49; NS
3.	Using mobile	19	38	50.0	0.09; NS
4.	Listening music	45	71	63.4	0.87; NS
5.	Engaged in conversation	26	38	68.4	0.43; NS
6.	In stress	40	53	75.5	0.04; S
7.	Alcohol influence	46	60	76.7	0.01; S
8.	Fatigue	14	23	60.9	0.86; NS
9.	Tobacco usage	12	23	52.2	0.29; NS

^{*}The total number of patients with several risk factors does not make up the total number of 560 patients as some persons might had more than one risk factor. Hence the Chi-square test was applied separately for each risk factor.

Table 4: Particulars of passengers as patients (N=260).

S. No	Particulars	Yes	Percentage
1.	Passenger position		
(a)	Back	216	83.1
(b)	Front	31	11.9
(c)	Middle	13	5.0
2.	Passenger density		
(a)	Normal	209	80.4
(b)	Crowded	49	18.9
(c)	Low occupancy	2	0.7
3.	Felt that vehicle was over speed		
(a)	Yes	145	55.8
(b)	No	115	44.2

Most of the victims were drivers (48.5%) followed by passengers (31.7%) and pedestrian (19.8%). In the present study, the commonest activities of pedestrians at the time of accident was watching surroundings (71.0%), walking on the road (59.9%) and crossing the road (34.6). It was found that the patient was owner of the vehicle in 65.1% cases while 70.3% had a valid driving license (Table 1). Regarding Helmet usage, out of 354 drivers of motorcycle, no one had used helmet. Absence of strict helmet usage law may be one of the reasons.

Only 26% of the four wheeler occupants were using seat belt (Figure 1). It was found that 29.2% were under the influence of alcohol, 12.7% were listening to music, 6.8%

each were using mobile phones or engaged in conversation. Further 9.5% had some form of stress at the time of accident, 6.3% had a history of road traffic accidents while 4.1% were smoking /chewing tobacco at the time of accident (Table 2).

The proportion of grievous injury was most commonly associated with not wearing seat belt (90.0%) among 20 four wheeler drivers. Similarly 76.7% and 75.5% of those who have stress and under alcohol influence respectively had sustained grievous injury. Likewise 68.4% of victims with grievous injury were engaged in conversation with others at the time of RTA. Among 560 victims, 63.4% and 60.9% with grievous injury were in fatigue and

listening music respectively, while 57.1% had past history of RTA (Table 3).

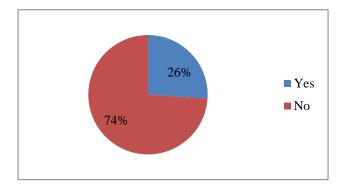


Figure 1: Percentage of Seat belt usage in four wheelers including drivers & passengers (N=54).

Passenger position was mostly in the back (83.1%) in contrast to front (11.1%) and middle position (5.0%). The passenger density was mostly normal (80.4%) while over speed of the vehicle was reported in as much as 55.8% of the respondents (Table 4).

Among 34 four wheeler passengers, 30 were not using seat belt and 21 had suffered grievous injury. 67.6% of the victims who felt that their vehicle was over speed had sustained grievous type of injury. Regarding position most of the front (74.2%) and middle (61.5%) passengers had grievous injury followed by passengers at back (56.9%). Similarly all the passengers in low occupant vehicles (100%) had grievous injury whereas 59.8% and 55.1% of normal density and of crowded vehicle passengers respectively had grievous injury (Table 5).

S No	Variable	Simple injury (%)	Grievous injury (%)	Total (%)	P value
1.	Passenger seat belt (N=34)			10001 (70)	
	Yes	4(100.0)	0(0)	4(100.0)	$\chi^2 = 7.32$; df=1;
	No	9(30.0)	21(70.0)	30(100.0)	P=0.007 S
2.	Vehicle over speed				
	Yes	47(32.4)	98(67.6)	145(100.0)	$\chi^2 = 9.47$; df=1;
	No	59(51.3)	56(59.2)	115(100.0)	P=0.002 S
3.	Position in the vehicle				
	Front	8(25.8)	23(74.2)	31(100.0)	χ^2 =3.37; df=2; P=0.18 NS
	Middle	5(38.5)	8(61.5)	13(100.0)	
	Back	93(43.1)	123(56.9)	216(100.0)	
4.	Passenger density				
	Normal	84(40.2)	125(59.8)	209(100.0)	$\chi^2 = 1.75$; df=2; P=0.41N S
	Crowded	22(44.9)	27(55.1)	49(100.0)	
	Τ	0(0,0)	2(100.0)	2(100.0)	

Table 5: Type of injury in relation to risk factors of passengers (N=260).

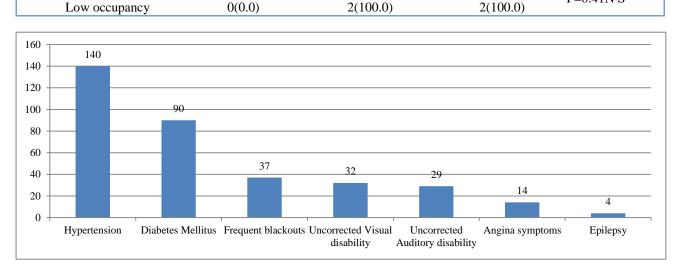


Figure 2: Distribution of pre-existing medical disorders among road traffic accident cases.

Hypertension was found in 17.1% of cases while diabetes was found in 11.0% cases. Frequent blackouts were reported in 4.5% patients while uncorrected visual and auditory disabilities were found in 3.9% and 3.5% respectively (Figure 2).

DISCUSSION

Out of 820 victims, Most of the victims were drivers (48.5%) followed by passengers (31.7%) and pedestrian (19.8%). Whereas in a study done by Nilamber Jha, 45%

of the victims were occupants of vehicles.⁷ In the present study 34.6% of the pedestrians were crossing the road during RTA. While it was 78.2% in a study at NIMHANS by Gururaj.⁸ Among 398 drivers, 70.3% had a valid driving license and 48.0% of the drivers had driving experience of 1-5 years. Studies at Uttarakhand⁹ and Sri Lanka found that 53.4% and 47.0% of the drivers do not have driving license.¹⁰ Further study done by Dixit et al, revealed that 51.5% who met the accident were having driving experience of >5 years.¹¹ While in a study at Pune, it was found that 27.35% and 22.31% had driving experience of less than 5 years and 5-10 years respectively.¹²

Out of 354 drivers of motorcycle, no one had used helmet. Absence of strict helmet usage law may be one of the reasons. Above all vehicle user's behavior in wearing the protective equipment plays a key role. Change in the mindset must be in a positive direction. The study conducted by Trivedi and Rawal found that 88.5% were not helmeted during driving, while it was 92% in another study at Nepal. Almost two thirds of the four wheeler occupants (74%) including drivers and passengers had not used seat belt while travelling. In a study at Uttarakhand, 88% of four wheeler occupants were found to be not wearing seatbelts. 11

In the present study, 29.2% of the victims of RTA were found alcoholic. Study at Haryana, shown that among the victims 18.01% gave a history of alcohol consumption within 6 hours before the RTA. In a WHO supported study, 16.9% of drivers were found to consume alcohol 2 to 3 hours prior to accident. Similarly Sreedharan et al had found that 20% of the motorcycle riders had consumed alcohol.

6.8% were talking in mobile phones at the time of RTA and 6.3% had previous history of RTA in the present study, whereas 42.4% of young drivers had used mobile phones while driving in Gujarat and 6% had met accident in past in Agarwal et al study. 18,19 Among 260 passengers, 18.8% responded that vehicle was crowded during RTA. While study by Manna et al it was 15.5%. 20 Similar observations was also seen in studies conducted by Ganveer et al and Patil et al. 21,22 Overloading leads to loss of balance and loss of control over the vehicle which eventually leads to accident.

CONCLUSION

There is a need for encouraging and promoting safe driving behaviour among community members by increasing the awareness through road safety campaigns. More over by establishing integrated surveillance systems, information regarding road traffic injury burden and their causal/risk factors can be generated, which hopefully help in developing preventive measures. Enforcement of stringent laws by implementing penalty and imprisonment if required for those violating traffic rules.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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