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AN EPIDEMIOLOGICAL STUDY OF ROAD TRAFFIC ACCIDENT CASES AT A TERTIARY CARE HOSPITAL IN UDAIPUR

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ABSTRACT

Background: In present century, road traffic injuries represent a major epidemic of non-communicable diseases. Road traffic accidents cause considerable economic loss to nation, victims, and society. The price we pay in terms of hospitalization of victims for longer duration, incurring disability and death. If the cause is probed, it would be possible to reduce its number, severity of injury and even the prevention of RTAs.

Objectives: To study the various epidemiological factors associated with road traffic accidentcases.

Materials and Methods: 400 road traffic accident cases were studied, at emergency unit of RNT Government medical college, Udaipur, during the period of July 2010 to December 2010.

Results: Among the 400 study subjects, majority (81.0%) were males, while (19%) females, most of them (33.25%) were in age group of (15-25) years. The motorcyclist comprised (42.5%) of RTA cases, followed by (20.25%) of occupants of car and jeep. Fatal injury (death) was more common(27.56%) in cases of motorized vehicle followed by the pedestrians (10.40%). Among 252 drivers majority (85.71%) were male and (32.94%) of them were not having driving licence. Highest RTAs (33.14%) occurred in drivers who had driving licence issued within two years. Nearly half (49.25%) of RTA cases took place between 5 PM to 9 PM and a good number of drivers(20.23%) reported that they were fatigued at the time of accident.

Conclusion: Road traffic accident is a major public health problem which needs to accelerate the efforts of road safety preventive measures.

Key Words: Motorized vehicle, Fatal injuries, Driving licence, Fatigue, Public health

INTRODUCTION

The importance of accident as a health problem is perhaps not looked sufficiently by health planners, even not enough weightage is given by lay people. Road traffic accident is a major but neglected public health problem, warranting us for initiation of effective preventive measures of road safety and we have to sustain them. An accident has been defined as an unexpected unplanned occurrence due to a chain of causes, which may involve severe and fatal injury but RTAs are preventable to some extent by safe driving. Accidents are the major burden of the both the developed and developing nations. It is increasing rapidly as a cause of death in absolute numbers and alsoin terms of proportion.Road traffic accidents are projected to become second leading cause of deaths in the world by 2020. In many countries, the motor vehicle accidents rank first among all fatal accidents.

During 2002, there were almost 1.19 million deaths due to road accidents in the world and the global rate of death was about 19.0 per 100000 people. The SEAR Region in the world, leads to higher rates of RTAs, with (16-18%) of annual increase in motorization. Person injured in RTAs occupy nearly (10-30%) of beds in hospital and shall be the biggest cause of ill health and death for adult men aged 15-45 years worldwide. The RTAs are the primary cause of disease among the children below 15 years of age.

In India, out of total deaths in non-communicable diseases, 11 per cent deaths are due to injury and 78 per cent of injury deaths are due to RTAs. The Indian council of Medical Research (ICMR) study on "Causes of Death by Verbal Autopsy" has revealed that injury ranked among the first five major cause of death in adults. It is the leading cause of mortality for young adults less than 45 years and a major burden

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of disease across all age group. Road injuries are not only placing a heavy burden on nation economy but also affecting the households.

Objectives: To study the various epidemiological factors related to road traffic accident cases.

MATERIALS AND METHODS

All cases of motorized vehicle accident, urban and rural attending emergency unit ofM.B. hospital, a tertiary level care, of R.N.T. Medical College Udaipur, during July to Dec. 2010, were included in this cross sectional study.The information of injury pertaining to epidemiological factors and demographic profile was collected on a pre-designed-proforma. Complete history was taken from the patient, attendant and case sheets, at casualty, OPD, IPD and forensic department and cross checked with the police reports with the information on environmental factors like roads, time of occurrence of accident, type of vehicle, driving licence and non-observation of traffic rules etc. on part of victim or driver with oral or written consent.

RESULTS

400 RTA cases were studied which caused 366(91.50%) injury and 34(8.5%) fatal injury (deaths). Among all the RTA cases there were 252 drivers and among them 169 drivers had driving licence.

Table 1. Out of total 400 RTAs, the maximum 321(80.25%) cases were from the age group of 15 to 45 years. There were (15.75%) of cases in age of 45 years and above, while (4.0%) were under 15 years of age. This indicates the major involvement of young productive age group in RTAs.

Majority of RTA cases were male 324(81.00%), while 76(19.00%) female, indicating 4:1, male female ratio. Males are more prone to meet an accident because of the preponderance act of driving the motor vehicle along with more outdoor activity than females.

Table 2. Out of all the RTAs, according to type of injury and road user the majority affected were single vehicle motorcyclist (42.5%) followed by occupant of car/jeep (20.25%), pedestrian (12.00%) and cyclist (6.50%). In 34 fatality cases the majority 27(27.56%) were observed in motor vehicle, followed by 5(10.40%) of pedestrians and 2(7.69%) of cyclist.

Table 3. Among 400 RTA cases, the affected were252(63.00%) drivers against other person 148(37.00%). Males were affected more in boththe drivers and other persons (85.71% and 72.97%) v/s females (14.28% and 27.02%).

Table 4. Among the 252 drivers, 169(67.07%) were observed with driving licence against 83(32.94%) without issue oflicence. The fatal and serious injuries were observed more (10.84% and 54.21%) among the victims with no driving licence v/s (5.30% and 35.50%) with driving licence.

Table 5. Among the 169 drivers, highest casesof road traffic accident 56(33.14%) were observed in victim of driving licence issued with two years of duration. There was decrease in incidence of accidents in drivers with the increase in duration of driving licence. The fatal and serious injuries (8.92% and 50.0%) were more in drivers having driving licence of less than two years against (0% and 20.0%) in drivers having driving licence of more than 10 years of duration

Table 6. Nearly half (49.25%) of the study subjects of RTA cases met with accident between 5 PM to 9PM,followed by (24.75%) occurred between 1 PM to 5 Pm. Maximum (87.0%) of the RTAs occurred during (9 AM to 9 PM).

Table 7. Among the driver related causal factors, majority of drivers responded forfatigued/drowsy 51(20.23%), followed by listening music 48(19.05%), smoking 22(8.73%) and talking on mobile or other person 17(6.74%).

DISCUSSION

In this study on RTAs the age of the victims varied from less than 15 to above 65 years. Majority (80.25%) of the study subjects were both males and females in the age group 15 and 45 years. Similar findings were also reported by Lee MC[1] et.al. (84.0%). N Jha[2] et.al. (69.2%). In our study (33.25%) of the cases were accounted in age group 15 to 25 years where as P. Shruthi[3] et.al. observed (55.11%). N Jha[2] et.al. reported (31.0%)among age 21-30 years**.**The victimsbelong tomost active and productive age group add to a serious economic loss to community.

Sex of the victims: The majority of the subjects were male (81.0%) and female (19.0%), similar results were observed by Jha S.et.al.[4] (78% and 22%), Sinha and Sengupta[5] (80% and 20%), Banerjee[6] (86% and 14%), M Johnson[7] (89% and 11%). Majority of males were the victims in RTAs observed in the study by Sathiyasekaran[8] (82.5%) and N. Jha[2] et.al.(83.0%), Chaudhary[9] et.al. from Maharashtra, (83.20%). Higher incidence in males can be explained due to their part of occupation with more exposer to risk of road accidents.

In the distribution of victims according to road users, majority (42.51%) were motorcyclist, followed by (20.25%) car/ jeep and(12.0%) pedestrians. Results of our study were supported by Abhisek Singh[10] et.al. (41.51%) motorcyclist, (19.39%) car/jeep, and(13.41%)pedestrian.

N Jha[2] et. al. reported (24.4% and 21.2%), Mondal[11] et.al (20.70% and 16.9%), Gunjan B[12] et.al. (26.95% and 43.02%) cases of two wheelers and car/jeep respectively Gururaj[14] et.al. and Sahdev[15] et.al also reported the same findings for two wheelers and car/jeep. Vimla Thomas[13] et.al. observed more cases of motorcyclist and car/ jeep (37.33% and 21.26%). The two wheeler motorized vehicle are affected more as they are comparatively unstable in moving condition on road than four wheelers.

In our study majority of fatal injuries were motorized vehicle of all the types (27.56%) followed by pedestrians (10.40%). Manisha Ruikar[16] observed pedestrian (8.3%) and two wheelers (23.2%), P Shruthi[3] et.al revealed that majority of victims were pedestrians (44.89%).

Among the 252 drivers, majority 216(85.71%) weremale. This is supported by a comprehensive review of 46 studies conducted by Odero W[17] et.al. observed that in low and moderate income countries males were involved in a mean of (80.0%) of road crashes and (87.0%) of drivers were male. Whereas V. Thomas[13] reported (64.22%) of the drivers were victims.

In our study out of 252 drivers, (32.94%)were not without issue of driving licence, which is higher comparative to the study of Abhisek singh[10] et.al. (16.24%), N Jha[2] et.al. (15.3%), V. Thomas[13] et.al. (12.80%). In our study fatal injuries (10.84%) were more in drivers with no licence against the drivers (5.30%) with licence.The reason may be the casual attitudeof thedrivers towards obtaining thedriving licence with no fear of check by traffic police.

In the 169 drivers with licence, the majority of accidents 56(33.14%) were observed in drivers who had driving licence issued within two years, with maximum fatal injury 5(8.92%) and serious injury 28(50.0%). Practice makes a man more prefect, more the experience less the chance of accident. Number of years of experience after issuing of licence is inverselyproportional to outcome of accidents. Our findings are supported by Mclean AJ[18] in his study of injuries in Australia, Japan, Malaysia and Singapore and Williams AF[19] also observed that the risks were high during the first 12 months after a full licence had been issued.

In our study peak time of accident was 5PM to 9 PM197(49.25%) followed by 1 PM to 5 PM 99(24.75%), whereas Mondal[11] et.al. reported maximum RTA (16.3%) during 3PM to 6PM, followed by (15.2%) during 9AM to 12 noon.

N Jha[2] et.al. observed two peaks 4PM to 5PM (8.9%) and 6PM to 7PM (7.4%). V Thomas[13] reported (71.10%) of RTAs in day time, 6AM to 6PM while N. Jha[2] observed (60.0%). In our study RTAs occurred (87.0%) (9AM to 9PM), while Khajuria[20] et.al. observed (54.2%). The peak time of accident may be because of the busiest hours of increased activity such as commercial, school, college and offices etc. This increases the probability of the accidents onbusy and crowded roads with heavy traffic.

In our study for driver related factors for RTAs, the major factor observed was fatigue/drowsy 51(20.23%) followed by listening music 48(19.05%), smoking 22(8.73%) and talking on mobile (6.74%). An analysis of road accident data in 2011 by Press information bureau[21] revealed that fatigue (77.5%) was the single most important factor responsible for accidents, similarly Mondal P[11] et.al. observed (75.0%) due to drivers fault. Donald A R[22] et.al. observed that the risk of collision was four times higher when cellular telephone was being used during driving.

Limitation: This is a single hospital based cross sectional study with small sample size hence results of this study cannot be generalized to general population but still be useful and relevant for our country especially regarding the preventive aspect.

Ethics and data management: The ethical clearance was taken from the RNT Government medical college Udaipur and the collected data was analysed in excel sheet of MS office with Chi-square test.

CONCLUSION

Road traffic accidents are increasing the burden of severe injuries, disability and deaths. RTAs are affecting the nation's economy. The family of the victims face the hardshipof day to day activity of livelihood. Present study showed that road traffic accidents were more common in the younger age groups. Two wheelers are more vulnerable, good number of drivers was found without issue of driving license. The incidence of road traffic accidents can be minimized by increasing the awareness among the drivers, family and community. Government should step in forefficient transport system, safety traffic rules, cashless treatment policy in emergency, instructions for strict governance and implementation of driving license, traffic rules and regulations by police and transport authority.

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Table 1: Distribution of RTA cases according to their age and sex.

Age group in years	Male	Female	Total
< 15	11 (2.75%)	5 (1.25%)	16 (4.00%)
15-25	113 (28.25%)	20 (5.00%)	133 (33.25%)
25-35	103 (25.75%)	17 (4.25%)	120 (30.00%)
35-45	51 (12.75%)	17 (4.25%)	68 (17.00%)
45-55	24 (6.00%)	8 (2.00%)	32 (8.00%)
55-65	16 (4.00%)	5 (1.25%)	21 (5.25%)
Above 65	6 (1.50%)	4 (1.00%)	10 (2.50%)
Total	324 (81.00%)	76 (19.00%)	400 (100%)

Age and sex distribution of the injured RTA cases is displayed in figure.

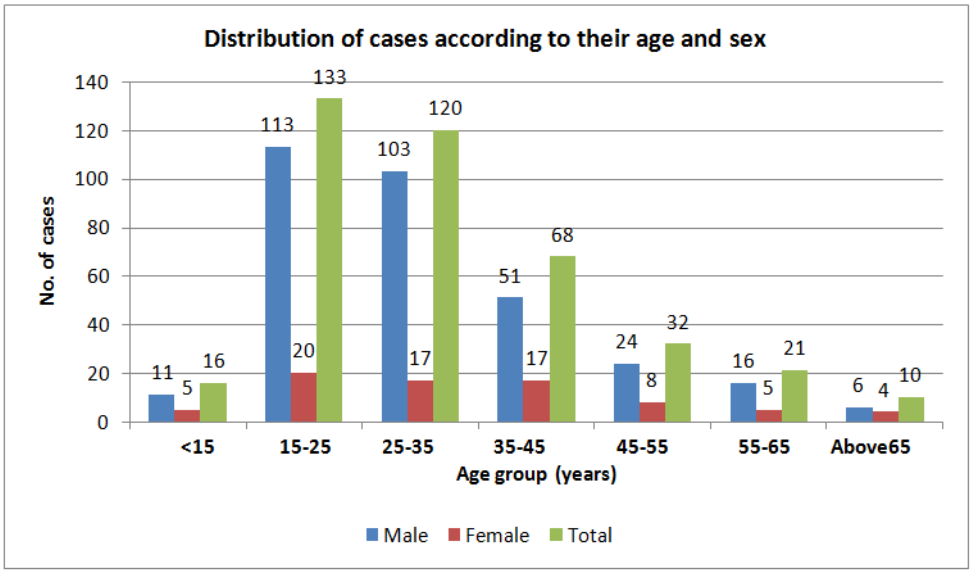

Table 2: Distribution of RTA cases according to type of injury and road users.

Type of road users	Number of Patients			
	Minor injury	Serious injury	Fatal injury	Total
Pedestrians	21(43.75)	22(45.80)	5(10.40)	48 (12.0)
Cyclist	13(50.00)	11(42.30)	2(7.69)	26 (6.50)
Motorcyclist/Scooters	73(42.93)	80(47.05)	17(10.00)	170 (42.50)
Occupant of car and jeep	42(51.85)	32(39.50)	7(8.64)	81 (20.25)
Occupant of medium transport vehicle	29(60.41)	17(35.40)	2(4.16)	48 (12.0)
Occupant of heavy vehicle	13(61.90)	7(33.30)	1(4.76)	21 (5.25)
Others	5 (83.3)	1(16.60)	0(0.00)	6 (1.5)
Total	202(50.5%)	164(41%)	34(8.5%)	400(100%)

Table 3: Distribution of study subjects according to their sex and drivers and other persons.

Sufferers in accident	Male	Female	Total
Drivers	216(85.71%)	36(14.28%)	252(63.00%)
Other persons	108(72.97%)	40(27.02%)	148(37.00%)
Total	324(81.00%)	76(19.00%)	400(100%)

P value is 0.0017 (P <0.01) Significant

Table 4: Distribution ofstudy subjects according to issue of driving licence and type of injury (N= 252 drivers in 400 RTA cases).

Driving licence status Have/do not have	Number of patient			Total
	Minor injury	Serious injury	Fatal injury	
HaveDriving licence	100 (59.17%)	60(35.50%)	9 (5.30%)	169(67.06%)
No Driving licence	29 (34.93%)	45 (54.21%)	9 (10.84%)	83 (32.94%)
Total	129(51.19%)	105(41.67%)	18(7.14%)	252(100%)

P value 0.00103 (P <0.001) Significant

Table 5: Distribution of drivers according to duration since issue of driving licence and type of injury (N=169, drivers, who had driving licence).

Duration of driving licence	Number of patient			
	Minor injury	Serious injury	Fatal injury	Total
< 2 Years	23(41.07%)	28(50.00%)	5(8.92%)	56(33.14%)
2-5 Years	32(61.53%)	17(32.69%)	3(5.76%)	52(30.77%)
5-10 Years	25(69.44%)	10(27.77%)	1(2.77%)	36(21.30%)
>10	20(80.00%)	5(20.00%)	0(0.00%)	25(14.79%)
Total	100(59.17%)	60(35.50%)	9(5.33)	169(100%)

P < 0.05, (P value is 0.0244) Significant

Table 6: Distribution of RTA cases according to occurrence of accident and time in a day.

Time of accident	Number of the patients
1 AM to 5 AM	1 (0.25%)
5 AM to 9 AM	5 (1.25%)
9 AM to 1 AM	52 (13.00%)
1 PM to 5 PM	99 (24.75%)
5 PM to 9 PM	197 (49.25%)
9 PM to 1 AM	46 (11.50%)
Total	400(100%)

Table 7: Distribution of study subjects according to driver related causal factors.

Cause/Condition	Number of cases
Talking on mobile/other person	17 (6.74%)
Listening music	48 (19.05%)
Drug addiction	4 (1.59%)
Smoking/tobacco chewing	22 (8.73%)
Associated medical diseases *	5 (1.98%)
Fatigue/drowsy	51 (20.23%)
Defective vision/hearing	2(0.79%)

Multiple factors, total not additive
Associated medical diseases- DM/HT/CVD/Asthma/Epilepsy