ORIGINAL ARTICLE

Correlates of road traffic accident in cases attending Lala Lajpat Rai Hospital, Kanpur

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Abstract

Introduction: Globally, road traffic accidents rank 8th among the leading causes of death. According to WHO data, deaths from road traffic injuries account for around 25% of all deaths from injury. **Objective**: To study the various correlates of road traffic accident in cases attending LLR Hospital, Kanpur. **Materials and Methods**: The study was conducted among road traffic accident cases attending Emergency Ward of Lala Lajpat Rai Hospital, Kanpur, Uttar Pradesh during the period of March-September, 2015. Data was recorded in a pre-designed and pre-tested questionnaire and analyzed using SPSS software version 16.0. **Results**: Out of 609 RTA cases, maximum number (54.19%) were in 20-40 years age group. Most of the RTA victims were males (69.95%) and majority were literate (90.97%). Maximum number (28.74%) of RTA took place between 4.00 p.m-8.00 p.m. Maximum number (36.95%) of RTA victims were two-wheeler drivers, followed by two-wheeler riders (26.60%). 16.60% of drivers of motorized vehicles had no driving license. 85.48% of motorized vehicle users were not using any protective gear (helmet, seat belt etc.) at the time of accident. **Conclusion:** Young adults in the economically most productive age group were the commonest victims of RTA. There is need of creating awareness regarding traffic rules among general public and strict enforcement of traffic rules by the concerned authorities.

Key Words

RTA; RTA victims; driving license; protective gear

Introduction

According to World Health Organization (WHO), accident is an unpremeditated event resulting in recognizable damage.(1) Road traffic accident (RTA) is an accident that occurs on a way or street, involves at least one moving vehicle and results in injury or death of one or more persons.(2) Hence in RTA a vehicle may collide with another vehicle, pedestrian, animal or any other obstacle. As per the Haddon Matrix, there is an interaction between human, vehicle and environmental factors before, during and after an accident.

Road transport is the most complex and most dangerous of all the systems that people have to deal with daily. The epidemiological triad of RTA consists of rapid increase in personalized modes of transports (Agent), lack of road discipline (Host) and improper roadway features (Environment). An improper interaction between them could be the result of complex interplay of a number of factors such as, behavior of road-user, condition and type of road, characteristics of driver, characteristics of traffic, environmental aspect etc. Thus the occurrence of RTA is a complex phenomenon.

Currently, injuries following road traffic accidents are the 8th leading cause of death globally and the

leading cause of death for young people aged 15-29 years. Each year, more than a million people die following RTA. According to WHO data, deaths from road traffic injuries account for around 25% of all deaths from injury. Globally, there is an increase in the incidence of road traffic accidents. The rates of road traffic accidents in low and middle income countries are twice as those in high income countries and it costs them 1-2% of their gross national product. This may be due to the rapid rate of motorization in developing countries without a concomitant investment in road safety strategies and land use planning. Unless urgent action is taken, as per current trends, road traffic accidents will become the 5th leading cause of death by 2030 and there will be further accentuation of the disparity between high and low income countries. In 2010, a "Decade of Action for Road Safety (2011-2020)" was proclaimed according to a resolution unanimously adopted by the United Nations General Assembly.(3) With one of the largest highway and road networks, 6% of the world's RTA share is contributed by India. On the contrary, India has only 1% of world's vehicle population. With rapid motorization, there has been a steady rise in the incidence of road traffic accidents in the country. According to WHO, currently the 6th leading cause of death in India is RTA. At the national level, an accident occurs every minute and death every 8 minute. Also, there are significant variations in the magnitude of RTA between different states of India. According to National Statistics of Road Traffic Accidents, during the year 2012, Tamil Nadu reported the highest number of deaths due to RTA followed closely by Uttar Pradesh. In Lucknow, majority of accidental deaths were due to RTA.

Kanpur is one of the greatest industrial giant of Northern India, where life runs in its full spectrum of riches and rags. It has grown in leaps and bound from a tiny congregation of villages to present day bustling and dynamic industrial and commercial metropolis. It is a city of multicultural complex consisting of population of all social strata of life. It is the main centre of commercial, trading, educational & industrial activities in Uttar Pradesh. A vital component of development is road transport. Unfortunately, insufficient attention has been given to road safety in planning road construction projects. As a result, the increasing number of motorized vehicles has led to significant increase in the rate of road traffic accidents. To raise awareness about the magnitude of road traffic accidents and to convince policy-makers of the need for action, reliable and accurate data are needed. There is an immense need of strengthening and undertaking research on this public health burden. Hence the present study was conducted to ascertain the various correlates of road traffic accident (RTA) in cases attending the Emergency Ward of LLR Hospital, Kanpur.

Aims & Objectives

1. To study the biosocial correlates of RTA victims.
2. To study the various correlates of RTA

Material and Methods

The hospital based cross sectional study was conducted at the Emergency Ward of Lala Lajpat Rai Hospital which is an associated hospital of G.S.V.M Medical College, Kanpur. Ethical clearance was obtained from the Institutional Ethical Committee prior to the conduction of the study. All RTA cases attending the Emergency Ward during the period of March-September, 2015 were included in the present study. Unconscious cases with no accompanying person, cases where complete information could not be obtained and cases who did not give consent for the study were excluded.

The final sample size consisted of 609 RTA cases. Epidemiological information and other related data of study subjects was recorded in a pre-designed and pre-tested questionnaire. A general health examination of cases was done using standard methods and body part sustaining injury was recorded as per WHO's injury reporting form.

Statistical analysis: The Master table was prepared from the data collected using MS Excel software and was analyzed using SPSS software version 16.0.

Results

Maximum number (54.19%) of RTA victims were in 20-40 years age group followed by 40-60 years age group (22.99%). 14.29% of the cases were below 20 years of age. In total, majority (77.18%) of the cases belong to 20-60 years age group. Most of the cases were males (69.95%) followed by females (30.05%). Most (62.40%) of the cases were from rural areas followed by those from urban areas (37.60%). Majority (90.97%) of the RTA victims were literate while 9.03% were illiterate. Majority (89.98%) of the cases were employed while only 10.02% were unemployed (Table 1)

Maximum number (28.74%) of RTA cases took place between 4.00 p.m.-8.00 p.m. followed by 8.00p.m.-

12a.m. (25.12%). The least number (4.43%) took place between 4.00 a.m-8.00 a.m. (Table 2).

Maximum number (36.95%) of RTA victims were two-wheeler drivers, followed by two-wheeler riders (26.60%). In total, 71.59% of RTA victims were occupants of motorized vehicles (Table 3).

16.60% of drivers of motorized vehicles had no driving license (Table 4).

85.48% of motorized vehicle users were not using any protective gear (helmet, seat belt etc.) at the time of accident (Table 5).

Maximum number (50%) of pedestrians were hit by two-wheelers. The commonest offending vehicle was four-wheeler (48.21%) (Table 6).

Maximum number of two-wheeler users sustained head injury (64.55%) as well as lower limb injury (60.91%) (Table 7).

Discussion

In the present study, maximum number (54.19%) of RTA victims were in 20-40 years age group. Similar trend was seen in the study conducted by Aggarwal KK *et al* in Patiala where the most common age group involved was 21-30 years (31%) followed by 31-40 years (24%).(4) In a study conducted by Suryanarayana SP *et al* in Bangalore, Karnataka, 74% of the injured subjects were between 15 and 44 years.(5) Most (69.95%) of the RTA victims were males. Similar trend was observed by Suryanarayana SP *et al* (76.4% males), Menon Geetha R *et al* in Bangalore and Pune (76.9% males) and Pruthi N *et al* in Bangalore (70.4% males) where maximum number of injured subjects were males.(5,6,7) Thus maximum number of RTA victims belong to the economically most productive age group because of their active lifestyle and greater involvement in outdoor activities. This eventually leads to significant reduction in country's productivity and affects the economy.

In the present study, maximum number (62.40%) of the cases were from rural areas. This finding is similar to the study conducted by Kaul V *et al* in Hubli, Karnataka where 70% of victims were from rural areas.(8) Ruikar M in her analysis of national trends of road traffic accidents also reported that in 2011, 53.5% of accidents occurred in rural areas.(9) This may be due to lesser knowledge regarding road safety norms among the rural population.

In the present study, majority (90.97%) of the cases were literate. This is similar to the observation in the studies by Suryanarayana SP *et al* where 88.4% of the victims were literate and Kaul V *et al* where 79.28% of the victims were literate.(5,8) Hence, spreading awareness among students regarding road traffic rules and regulations may help in reducing the incidence of RTA in the future.

In the present study, majority (89.98%) of the cases were employed. Similarly, in the study conducted by Mahajan N *et al* in Shimla also the highest number of victims were employees (34.7%).(10)

In the present study, maximum number (28.74%) of Road Traffic Accidents (RTA) took place between 4.00 p.m.-8.00p.m. while the least number (4.43%) took place between 4.00 a.m.-8.00a.m. Similar trend was observed in a study conducted by Pruthi N *et al* in Bangalore where majority of three-wheelers and pedestrian injuries (50.9%) occurred during peak traffic hours in the evening (1600-2100 hours).(7) Ruikar M in her analysis of national trends of road traffic accidents also reported that during 2012, 16.7% of road accidents in India have occurred between 1500-1800 hours followed by 16.6% between 1800-2100 hours and 6.3% between 0000-0300 hours.(9)

In our study, maximum number (36.95%) of RTA victims were two-wheeler drivers followed by two-wheeler riders (26.60%). 71.59% of RTA victims were occupants of motorized vehicles. This may be due to reckless driving by motorized vehicle users. This finding is similar to the finding in study conducted by Patil SS *et al* in Maharashtra where 49.7% of the victims were vehicle occupants, out of which 35% were occupants of motorized two-wheelers.(11) In a study conducted by Menon Geetha R *et al* in Bangalore and Pune, 73% of the road traffic victims were injured when travelling in a vehicle.(6) Similarly, maximum number of RTA victims were two-wheeler users in studies conducted by Suryanarayana SP *et al* (43.8%) and Kaul V *et al* (42.68%).(5),(8)

In the present study, 16.60% of drivers of different motorized vehicles had no driving license. Similar trend was seen in the study conducted by Jha N *et al* where 15.3% of drivers were not having driving license.(12) In a study conducted by Bhuyan PJ *et al* also, 15% of drivers were not having driving license.(13)

In our study, 85.48% of motorized vehicle users were not using any protective gear (helmet, seat belt etc.) at the time of accident. Similar trend was observed by Kaul V *et al* in their study where among the victims who were using two-wheelers, only 5.72% were

wearing helmets while none of the victims using four-wheelers were wearing seat belt.(8) In a study conducted by Suryanarayana SP *et al*, only 50% of two-wheeler users used helmets and only 19.3% of car drivers/occupants had used seat belt.(5)

In the present study, maximum number (50%) of pedestrians were hit by two-wheelers. Similar trend was observed in the study conducted by Patil SS *et al* where two-wheelers were involved in maximum number of pedestrian crashes (31.9%).(11) In a study conducted by Pruthi N *et al* also, maximum number (41.9%) of pedestrians were hit by two-wheelers.(7) This may be due to rash and impulsive attitude of two-wheeler users and lack of proper footpaths for pedestrians in Kanpur. In our study, the commonest vehicle involved in RTA was four-wheeler (48.21%). This finding is dissimilar to the study conducted by Pruthi N *et al* in Bangalore where two-wheelers were involved in majority of fatal injuries (39.9%) followed by four-wheelers (27.9%).(7) This may be due to increase in the number of four-wheelers because of improved living standards of people in and around Kanpur.

In the present study, maximum number of two-wheeler users sustained head injury (64.55%) as well as lower limb injury (60.91%). Similar trend was observed in the study conducted by Menon Geetha R *et al* (2007) in Bangalore and Pune where upper and lower limbs and head injuries were the most frequent among the two-wheeler riders.(6) This may be due to lesser usage of helmets by two-wheeler drivers and almost no usage by pillion-riders in and around Kanpur.

Conclusion

Maximum number of RTA victims were young adults in the economically most productive age group and were mostly males. Most of the cases were from rural areas. Majority of the RTA victims were literate and were employed. Maximum number of RTA cases took place between 4.00 p.m.- 8.00 p.m. Occupants of motorized vehicles were the most common RTA victims, of which, motorized two-wheeler users were the commonest. Some of the motorized vehicle drivers were not having driving license. The important conclusion of the study is that majority of the motorized vehicle users were not using any protective gear. Most of the pedestrians were hit by motorized two-wheelers while the commonest offending vehicle responsible for RTA in Kanpur was found to be four-wheeler. Head injury and lower limb injury were the commonest types of injury sustained by motorized two-wheeler users.

Recommendation

The drivers and travelling public should be educated regarding traffic rules. All drivers of motorized vehicles should possess a valid driving license. Driving license should be issued strictly based on the minimum proficiency acquired by the learners. There should be strict implementation of rules for compulsory wearing of helmets by two-wheeler drivers and pillion riders and seat belts by four-wheeler users. Proper footpaths should be laid to make walking safe. Intersections should be marked for pedestrian crossings. Traffic rules and regulations should be strictly enforced by the concerned authorities. Most of the major roads and junctions are encroached upon by parked vehicles and roadside hawkers. Encroachments on road margins should be removed to enable smooth flow of traffic. Haphazard parking of vehicles on roads should also be prevented. Recognizing RTA as a major public health problem, National Road Safety Policy was approved in India in 2010. Setting up of Road Traffic Injury Surveillance system at the national level will further help in proper planning, implementation and monitoring of road safety activities

Limitation of the study

Every hospital based study has its limitations and the present study is not an exception to this fact. Out of all RTA cases attending the Emergency Ward, only those cases who gave consent were included in the study.

Relevance of the study

The study would be relevant to the Road Transport Authorities in identifying the peak hours of road traffic accidents in Kanpur and in taking necessary measures for reducing the incidence in this region. For the general population, though the use of protective gear will not reduce the incidence of road traffic accidents, it will help in reducing the morbidity and mortality that may occur in the aftermath of an accident

Authors Contribution

SD: Conception of design, acquisition of data, analysis & interpretation, SN: Final Approval of manuscript, DSM: Drafting of article, PV: Analysis of data, SKB: Interpretation of data, TM: Revising the manuscript critically.

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Tables

TABLE 1 BIO-SOCIAL CORRELATES OF RTA CASES

Biosocial correlates	Cases (N=609)	%
Age		
<20	87	14.29
20-40	330	54.19
40-60	140	22.99
≥60	52	8.54
Gender		
Male	426	69.95
Female	183	30.05
Residence		
Rural	380	62.40
Urban	229	37.60
Educational status		
Literate	554	90.97
Illiterate	55	9.03
Occupational status		
Employed	548	89.98
Unemployed	61	10.02

TABLE 2 CASES ACCORDING TO TIME OF RTA

Time of RTA	Cases	%
8:00 a.m. – 12:00 p.m.	119	19.54
12:00 p.m. – 4:00 p.m.	98	16.09
4:00 p.m. – 8:00 p.m.	175	28.74
8:00 p.m. – 12:00 a.m.	153	25.12
12:00 a.m. – 4:00 a.m.	37	6.08
4:00 a.m. – 8:00 a.m.	27	4.43
Total	609	100

TABLE 3 CATEGORY OF ROAD-USERS IN RTA

Road-user	Cases	%
Pedestrian	70	11.49
Bicycle	103	16.91
Two-wheeler driver*	225	36.95
Two-wheeler rider*	162	26.60
Three-wheeler driver*	1	0.16
Three-wheeler rider*	11	1.81
Four-wheeler driver	9	1.48
Four-wheeler rider	24	3.94
Others**	4	0.66

TABLE 4 DRIVERS OF MOTORIZED VEHICLES HAVING DRIVING LICENSE

Motorized vehicle driver	Driving license		Total (%)
	Yes (%)	No (%)	
Two-wheeler	186 (82.67)	39 (17.33)	225 (100)
Three/Four-wheeler	10 (100)	-	10 (100)
Total	196 (83.40)	39 (16.60)	235 (100)

TABLE 5 USE OF PROTECTIVE GEAR BY MOTORIZED VEHICLE USERS

Motorized vehicle user	Protective gear		Total (%)
	Yes (%)	No (%)	
Two-wheeler*	60 (15.50)	327 (84.50)	387 (100)
Four-wheeler**	1 (3.03)	32 (96.97)	33 (100)
Total	61 (14.52)	359 (85.48)	420 (100)

**Helmet **Seat belt*

TABLE 6 ROAD-USER'S CATEGORY IN RELATION TO VEHICLE WITH WHICH COLLIDED

Road-user's category	Vehicle with which collided					Total (%)
	Bicycle (%)	Two-wheeler (%)	Three-wheeler (%)	Four-wheeler (%)	Others* (%)	
Pedestrian	-	35 (50.00)	7 (10.00)	26 (37.14)	2 (2.86)	70 (100)
Bicycle	-	26 (32.50)	6 (7.50)	36 (45.00)	12 (15.00)	80 (100)
Two-wheeler	2 (0.75)	52 (19.55)	41 (15.41)	130 (48.87)	41 (15.41)	266 (100)
Three-wheeler	1 (10.00)	-	-	8 (80.00)	1 (10.00)	10 (100)
Four-wheeler	-	2 (12.50)	1 (6.25)	13 (81.25)	-	16 (100)
Others*	-	-	-	2 (50.00)	2 (50.00)	4 (100)
Total	3 (0.67)	115 (25.78)	55 (12.33)	215 (48.21)	58 (13.00)	446 (100)

**Others include buses, trucks etc.*

TABLE 7 INJURED BODY PART AND ROAD-USER'S CATEGORY

Body part*	Road-user's category						Total (%)
	Pedestrian (%)	Bicycle (%)	Two-wheeler (%)	Three-wheeler (%)	Four-wheeler (%)	Others** (%)	
Head	41 (11.81)	50 (14.41)	224 (64.55)	4 (1.15)	26 (7.49)	2 (0.58)	347 (100)
Neck	-	7 (35.00)	10 (50.00)	-	3 (15.00)	-	20 (100)
Chest	3 (18.75)	4 (25.00)	9 (56.25)	-	-	-	16 (100)
Abdomen and pelvis	2 (11.76)	3 (17.65)	11 (64.71)	1 (5.88)	-	-	17 (100)
Shoulder and arm	1 (2.17)	5 (10.87)	37 (80.43)	2 (4.35)	1 (2.17)	-	46 (100)
Hand	2 (14.29)	1 (7.14)	9 (64.29)	2 (14.29)	-	-	14 (100)
Upper limb unspecified	-	4 (26.67)	3 (20.00)	2 (13.33)	6 (40.00)	-	15 (100)
Hip	-	-	2 (100)	-	-	-	2 (100)
Lower limb	37 (15.23)	44 (18.11)	148 (60.91)	6 (2.47)	6 (2.47)	2 (0.82)	243 (100)
Lower limb unspecified	2 (100)	-	-	-	-	-	2 (100)
Eye	-	4 (21.05)	10 (52.63)	-	5 (26.32)	-	19 (100)
Ear	-	4 (36.36)	6 (54.55)	-	1 (9.09)	-	11 (100)
Other organs	-	1 (100)	-	-	-	-	1(100)
Respiratory	-	-	-	-	-	-	-
Gastrointestinal	-	-	-	-	-	-	-
Urinary	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-
Multiple parts	-	2 (100)	-	-	-	-	2 (100)
Feet	-	-	5 (100)	-	-	-	5 (100)
Unspecified	-	-	-	-	-	-	-
Total	88 (11.58)	129 (16.97)	474 (62.37)	17 (2.24)	48 (6.32)	4 (0.53)	760 (100)

**as per WHO's Injury Reporting Form (2010) **Others include buses, trucks etc.*