ORIGINAL ARTICLE

Epidemiological study of road traffic accident cases in Greater Noida: Hospital Based Study

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Abstract

Introduction: Road accidents are associated with numerous problems each of which needs to be addressed separately [1]. Accidents, therefore, can be studied in terms of agent, host and environmental factors and epidemiologically classified into time, place and person distribution [2]. **Objectives:** 1.To assess the prevalence of RTAs coming to hospital and 2.To know the epidemiological factors related to RTAs and associated prevalence in hospital based study. **Methodology**: This cross sectional study was conducted at SMSR, Gr Noida, in 2012. The study group consisted of all the RTA victims reporting to casualty in the last one year. The victims of the accidents were interviewed on a pretested semi structured performa. **Results:** In that one year period total number of reported accident cases was 144. The age groups of the study subjects were between 13-65 years. Out of total study subjects, only 16 were female. Again out of the total accident cases 45% were attended by police and of all injured, 45.8% were driver by occupation (7% without driving license). Among these drivers, 11% were not attentive during driving because of various reasons. Ambulance services had reached in 46.5% cases. Fracture was the most common type (60%) of injury among all types of injuries. Among the applicable population only 33% wore helmet or seat belts. **Conclusions:** Only half of the total accident cases were attended by police and again only half of them received ambulance services. One third injuries were because of not wearing seat belt and helmets.

Key Words

Epidemiological; Road; Traffic; Accident; Hospital based.

Introduction

A Road Traffic Accident (RTA) can be defined as, 'An event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed, where at least one moving vehicle is involved [1]. Road accidents are associated with numerous problems each of which needs to be addressed separately [2]. Road traffic accident is one of the leading causes of deaths worldwide with the developing world most hit. It is estimated that deaths resulting from road traffic accidents are almost 1.2 million worldwide while injuries from such accidents are estimated at 50 million [3]. WHO (2009) reports say, half of all global road traffic deaths occur among young adults between 15 and 44 years of age. 73% of all global road traffic fatalities are males [4]. India already accounts for about 9.5% of the total 1.2 million fatal accidents in the world [5].

India with a population of 1.2 billion is witnessing a major shift in its health problems due to epidemiologic and socio-demographic transition. With marginal decline in communicable and infectious diseases, NCDs and injuries have become the leading causes of deaths, disabilities and hospitalizations in the country. While vaccine preventable diseases are major problems in children, NCDs are a problem of middle aged and elderly. In the young population of 15 - 44 years, injuries have become leading killer diseases [6].

Accidents, therefore, can be studied in terms of agent, host and environmental factors and epidemiologically classified into time, place and person distribution.

In order to formulate sound policies and programs, strong and robust data is an essential prerequisite. In India, except police sources, all other data systems are in infantile stages. The police data have major limitations and health sector data is virtually absent. Without proper collection, analysis, interpretation and application of data, sound policies and programs cannot emerge to control the problem. Evidence led programs based on intersect oral approaches are key to injury prevention and control in India. Surveillance, registries, good reporting systems and systematic research in academic institutions are still not in vogue in the country.

The present study is envisaged to study the epidemiological factors of road traffic accidents and to give recommendations for formulation of policy.

Aims & Objectives

To assess the prevalence of road traffic accident cases coming to hospital and to study the various epidemiological factors related to road traffic accident cases.

Material and Methods

This cross sectional study was conducted at School of Medical Sciences and Research Hospital, Greater Noida, UP, North India from 1st July, 2012 to 30th June 2013. The study group consisted of all the road traffic accident (RTA) victims reporting to SMSR casualty (total 144 cases) in the above-mentioned one year period. This study was not a major concern as no intervention was used in the study. Nevertheless, ethical clearance for the study was obtained from the Institutional Ethical Committee. For the purpose of the study, a Road Traffic Accident (RTA) was defined as accident, which took place on the road between two or more objects, one of which must be any kind of a moving vehicle.

Exclusion Criteria:

1. Any injury on the road without involvement of a vehicle (e.g. a person slipping and falling on the road and sustaining injury).
2. Injury involving a stationary vehicle (e.g. persons getting injured while washing or loading a vehicle).
3. Deaths involving a stationary vehicle.

The victims of the accidents (age criteria > 12 years) were interviewed to obtain the information about the circumstances leading to accident. A performa specially designed for this purpose was used for interviewing the accident victims, either in the casualty or in the wards of SMSR Hospital. The relatives or attendants were interviewed where the condition of the victims did not warrant the interview. Besides, informed consent was taken from each participant and confidentiality of the information collected was ensured.

The information collected consisted of personal identification data, time, date, day and type of vehicles involved in RTA, protective gear worn and category of physical injuries. If the person is driver then information about having valid driving license or he /she was being attentive or not was taken and recorded. The medico-legal records and case sheets were referred to for collecting additional information and where necessary for cross-checking. The data were summarized using percentages. The Chi-square test for goodness of fit (using statistical software Epi 6 [WHO / CDC Atlanta]) was applied to see if there was any association between the different variables associated with the accidents.

Results

In our study a total of 144 cases were included, who had fulfilled all inclusion criteria in one year period. As we had mentioned in the methodology that all the cases above 12 years were included in our study, so the age range was between 13 years to 65 years. Out of the total cases 88.9% were males and 11.1% were females. Table 1 shows the details of age and sex distribution of study victims.

Out of the total victims included in our study 68.8% were married and 31.2% were unmarried. The details of education status were shown in the table 2. Out of the total around 4.9% were illiterate, whereas more than 50% had education up to high school only.

Out of the total cases around 45.8 %(number 66) were drivers by occupation. Only 15.15% of all the drivers had driving license. Out of 66 drivers, 22.2% driver (number 16) was inattentive. The various reasons for inattentiveness are discussed in table 3. The most common reason for inattentiveness was alcohol. Around 46.5% cases were attended by ambulance services. In case of vehicle insurance, out of 66 drivers, 83.3% vehicle had no insurance or it had expired.

In our study, 45.1% cases were attended by police. Again we had tried to find out the other factors that were found to be associated with road traffic accidents and we enquired about various traffic conditions, which have been enumerated in table 4. The first most common (43.8%) traffic condition associated with RTA was roads without street light and second most common (24.5%) was rain/fog. In our study among road traffic accident cases the most

common type of injury was fracture. The prevalence of only fracture was 59%. The prevalence of fracture along with other injuries was 63.8%. Head injury was seen in 18% of all RTA cases. Unconsciousness was also reported by 2.1% cases.

In all these cases the most common type of vehicle used was two wheelers (49.3%). The second most common vehicle was four wheelers (20.8%). The details of other types of vehicles were shown in figure 1. Among all the cases, 47.9% road traffic injured reported that they did not wear helmets or fasten seat belts wherever it was applicable. Out of all vehicles two third of the vehicle (67.4%) had some emergency contact number.

 The relationship between age and wearing helmet or seat belt was found to be statistically significant (chi square 14.006, p value <0.05 at df 6) whereas the relationship between education status and wearing helmet or seat belt was not statistically significant (chi square value 0.272, p value 0.60 at df 3).

Discussion

A huge number of researches have been conducted to analyze road crashes. Across the world, especially in HICs, research - knowledge - evidence and data changed the understanding of injuries. Political commitment, professional involvement and proactive media supported policies and programs. Today, it is well acknowledged that injuries are predictable and preventable.

In our study, out of total cases 88.9% were male and 11.1% were female. Almost same result was found by Pankaj Bavan et al in his study in Pune, 2013 that the majority of victims were male, 177 (83.5%), while 35 (16.5%) were females [7]. Nilambar Jha et al (2004) also found almost the same result, 603(83%) male and 123(17%) female victims [8]. Only 15% of the road accident victims were females during the calendar year 2012 [9].

In the current study out of 66 drivers, 22.2% drivers (number 16) were inattentive. The most common reason for inattentiveness was alcohol (43.8%). The NCRB report also stated that drunken driving was a major factor for road accidents [9].

Selzer (1968) showed that alcohol was a major problem in single vehicle fatal accidents. In 72 fatal accidents which claimed 87 lives, he showed that half of drivers had serious drinking problems of chronic nature [10]. Abhishek Singh et al also noticed in their study that among the victims 18.01% gave a history of having consumed alcohol [11].

Road safety is emerging as a major social concern around the world especially in India. Drinking and driving is already a serious public health problem, which is likely to emerge as one of the most significant problems in the near future [3].

Critical analysis of different crash parameter merits itself as a necessary study from public health point of view. It is a well-known fact that rainfall creates lots of road traffic hazards [3].

In this study, 15.15% driver had no driving license. Whereas Oginni et al (2008) had further identified the specific risk factors such as 'uneducated and unlicensed drivers and riders, reckless driving, carelessness, drunkenness, lack of knowledge on road safety rules, driver's age, fatigue, unimplemented government policies, failure in law enforcement and corruption' [12] During 2011, driver's fault (77.5%) was the single most important factor responsible for accidents, as revealed by an analysis of road accident data by the Ministry of Road Transport and Highways [13].

Poor enforcement of traffic safety regulations in low income countries was due to inadequate resources, administrative problems and corruption. Corruption is a huge problem in some countries, often creating a circle of blame; the police blame drivers and the public, the public blames drivers and the police, and drivers blame the police. Corruption also extends to vehicle and driver licensing agencies [3].

In this study the first most common traffic condition associated with RTA was road without street light (43.8%) and second most common was either rain or frog (24.5%). Bayan et al (2013) was found in his study that most common cause cited for meeting with an accident was stated as poor visibility (14.62%), followed by fatigue (11.79%). Few complained of giddiness (1.41%) as cause of the accident [7] Nilambar Jha et al (2004) were interviewed 121 (24.5%), who mentioned that the road was wet at the time of RTA [8].

Peden et al (2001) was presented that 'the same road space gets used by modern cars and buses, along with locally developed vehicles for public transport (three-wheeled scooter taxis), scooters and motorcycles, tricycle rickshaws, animal and human drawn carts'. He added that infrastructure which is designed on the basis of homogeneous traffic models has failed to fulfill the mobility and safety needs of this traffic [14]. In our study in all these cases the most common type of vehicles was used two wheelers (49.3%). Whereas R. Manigandan also observed almost same result in his research that

according to type of vehicles 10.5% were accidents caused by buses, 16% reported by truck/lorry, 29% by car/jeep/taxi/tempo, and 32% by two wheelers in 2012. Three wheelers and others caused accidents 5% and 8% respectively in 2012 [3]. U Amir et al again given same information in his study that 73.7% were using two wheelers during accidents' [15]. Abhishek Singh et al also noticed in their study that motorized two wheeler accident was the most common type of accidents [11]. Nilambar Jha et al (2004) observed in his study that 23.3% buses, 21.5% trucks and 20.7% motorized two wheelers. Among two wheelers, mopeds were the highest in number (10, 9.3%) [8].

In the present study fracture become the most common (63.8%) type of injury. Pankaj Bayan et al (2013) mentioned that multiple injuries were most common (54.24%), followed by injuries to the lower limbs (38.67%). Fracture of the bones (71.69%) was the most common nature of injury [7]. U Amir et al discussed that fracture was found among 54.2% cases [14]. Another study from rural Haryana estimated the ratio of serious: moderate: minor injuries to be 1:29:69 [16]. Nirmalya Manna et al (2013) were found of the 206 RTA victims, 141 (68.44%) had fractures, 59 (28.64%) had head injury, 41 (19.91%) had abrasion, bruise, hematoma and visceral injury followed by 24 (11.65%) patients who sustained lacerated injury [17].

Conclusion

Preventing road crashes, suicides and other injuries requires a "proactive approach" rather than a "reactive approach". Action from police, transport, urban - rural development ministries, highway authorities, land development authorities, product and vehicle manufacturers, civic authorities, NGOs, public, media and others are required to save lives and limbs. If safety is given priority, injury and violence should not occur; even if it occurs, it should not lead to deaths and disabilities.

Relevance of the study

As we all know that in order to formulate sound policies and programs, strong and robust data is an essential prerequisite and again it has to be customized and area specific. Such types of data are not available for the said location.

Authors Contribution

All co-authors had helped since planning and designing of the study, in data compilation, analysis and interpretation of data; also helped in drafting the article.

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Tables

TABLE 1 AGE AND SEX DISTRIBUTION OF VICTIMS

Age Group(years)	Male (%)	Female (%)	Total (%)
13-17	4(3.1)	0	4(2.8)
18-40	110(85.9)	12(75)	122(84.7)
>41	14(10.9)	4(25)	18(12.5)
Total	128(100)	16(100)	144(100)

TABLE 2 EDUCATION STATUS OF RTA CASES

Education status	Frequency	Percent (%)
ILLITERATE	7	4.9
UPTO PRIMARY SCHOOL	13	9.0
UPTO MIDDLE SCHOOL	34	23.6
UPTO HIGH SCHOOL	31	21.5
INTERMEDIATE SCHOOL	33	22.9
GRADUATE&POST GREADUTE	24	16.7
PROFESSIONAL/HONOURS	2	1.4
Total	144	100.0

TABLE 3 VARIOUS REASONS OF INATTENTIVE DRIVING

Reasons for inattentiveness	Frequency	Percent (%)
ILLNESS	2	12.5
ALCOHOL	7	43.8
DRUG	3	18.7
FATIGUE	4	25
Total	16	100

TABLE 4 VARIOUS TRAFFIC CONDITIONS ASSOCIATED WITH RTA

Traffic Conditions	Frequency	Percent (%)
RAIN/FOG	35	24.3
DARK/NO STREET LIGHT	63	43.8
ROAD WITH HOLES/KACCHI ROAD/BUMPERS	22	15.3
SLIPPERY ROAD	14	9.7
OTHERS(ANIMALS)	10	6.9
Total	144	100

Figure

FIGURE 1 TYPES OF VEHICLES IN OUR STUDY

Types of Various Vehicle
Bus 5%, Others 4%, Truck 6%, Bicycle 7%, Three Wheeler 8%, Four Wheeler 21%, Two Wheeler 49%