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AN EPIDEMIOLOGICAL STUDY ON ROAD TRAFFIC ACCIDENT IN URBAN WEST-BENGAL

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ABSTRACT: Road traffic injuries nowadays take the place as a major public health problem constituting leading cause of mortality and morbidity globally and in India, more than a million are injured annually and about a lakh are killed in road traffic accidents. Road traffic accidents are defined as a collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed. In this context, an epidemiological study was conducted in a teaching hospital of West Bengal for last one year for better understanding of the factors involved in road traffic accidents. The study population comprised of all the victims of road traffic accidents attending the emergency department during the study period. Total 355 gave full response with written informed consent and included in the study. Every one out of five subjects was male. Most were from 10–29 years age group. Students (18.3%), skilled (21.9%) and unskilled worker (23.7%) by profession were found to be the major victims. More than half (55.5%) of the victims were involved in the two Wheeler accident. Among the all victims 25.92% were released after given first-aid and 48.73% were hospitalized. Half of the accident occurred in July – August and between 6 p.m. to 11p.m. The results can be corroborated with further studies with more robust hypothesis.

KEYWORDS: RTA, WHO, GNP, Questionnaire, Epidemiological study.

AIMS AND OBJECTIVES: To find out the epidemiological characteristics of road traffic accident in area around Kalyani municipality, West-Bengal.

REVIEW OF THE STUDY: Road traffic injuries are emerging as a major public health problem constituting leading cause of mortality and morbidity globally and in India, more than a million are injured annually and about a lakh are killed in road traffic accidents.¹ Though world Health Organization (WHO) had been recognized Road traffic injuries as a matter of concern nearly five decade ago (1962),² still it remains a prevailing problem worldwide. Road traffic injuries are the eighth leading cause of death globally, and the leading cause of death for young people aged 15–29.^{3,4} Current trends suggest that by 2030 road traffic deaths will become the fifth leading cause of death unless urgent action is taken.⁴ Road traffic accidents are defined as a collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed.⁵ In many low-income and middle-income countries, the burden of traffic-related injuries is such that they represent between 30% and 86% of all trauma admissions.^{6,7} In economic terms, the cost of road crash injuries is estimated at roughly 1% of gross national product (GNP) in low-income countries, 1.5% in middle income countries and 2% in high-income countries.⁸ Of the worldwide annual average of 700,000 road accidents, 10% occur in India. Over 100,000 people are killed on Indian roads annually. By 2020 it is estimated that road traffic accidents would have its fatal effect on about 55,0000 people annually.⁹ In this per view an epidemiological study was conducted for better understanding of the factors involved in road traffic accidents.

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METHODS AND MATERIAL: This cross-sectional study was conducted at College of Medicine & Jawaharlal Nehru Memorial Hospital (COM&JNMH), Kalyani, Nadia, throughout a year (2013-2014). The medical college is catering medical services not only in large area of Kalyani municipality, adjacent rural, semi urban areas of three district also at neighboring international border areas. Being situated in a critical geographical location its service area has some mixed socio-demographic and infrastructural characteristics. Kalyani municipality area itself has a good metal road, adequate traffic control, civic laws to prevent road traffic accident whereas its adjacent areas don't. Being a canter of trade, industrialization, education, medical services, it attracts huge number of people from different socio-economic background every day. The study population comprises all the victims of road traffic accidents attending the emergency department of COMJNMH in 1year. Total 379 victims or their relatives were approached. Among them only 355 gave full response with written informed consent. For this study socio demographic information (Like age, gender, Level of education, religion, Occupation), type of vehicles, timing of accident, area of accident, road condition, maintaining traffic rules, place of injury and mode of initial treatment was considered as study variable.

STATISTICS AND RESULTS: The data was collected and analyzed with help of simple proportions and percentage. MS Excel was used for analysis of data. Throughout the year starting from April 2013 a total of 426 patients and their relatives were approached by the on duty medical officers and among them 355 were considered for the study. Out of the 426, 71 proforma were rejected due incomplete fill up of the questionnaire, unavailability of the consent form. Many patients cannot be approached due criticalness of the condition, absence of relatives, and non-compliance of patient and/or relative. These exclusions, mainly the exclusion of severe cases may reflect as bias in the study and considered as one of the major limitation. The total no of case were approached might not reflect the overall case of accident in Kalyani, as some case might not be apprehended in the busy emergency and many cases went to other health facilities in the adjacent area.

The result gives an idea about primary epidemiological situation of accident in the area which may act as primer for further investigation. Among the total 355 victims 303(85.4%) were male and 52(14.6%) were female. Most of the male victims (31.4%) were in age group of 20-29 years where as more female were met an accident in age group of 10-19 years (26.9%). 17.3% of female victims were below 10 years of age (Table-1). Among the injured 120(34.2%) were driving the vehicles by the own, 94(26.7%) were passenger and 137(39.1%) were pedestrians. Majorities (62.7%) of the victims were educated up to middle class and only 8.5% were reached up to the graduate or higher level of education (Table-2). Though not in the scope of the study it may be hypothesized that level of education may have a possible association with occurrences of accidents. Students (18.3%), skilled (21.9%) and unskilled worker (23.7%) by profession were found to be the major victims. Among all victims 228(64.3%) were belonged to Hindu religions and 219(61.9%) were married. All the victims were result of 124 accidents which involved different type of vehicles. More than half (55.5%) of the victims were involved in the two Wheeler accident which includes the driver, passenger or pedestrian (Table-3).

It can be explained by the abundance of youth population in the locality due many educational institutions and scarcity of public transport. Among the 12.4% three wheeler accidents majorities were happened due to local public transport vehicles viz. auto. Victims followed by local railway accident were negligible as most of them did not survive the accident. Majorities (43.55%) of the accident occurred in the months of July and August which may be due to rainy weather of the area at those months. Duration between 6 p.m. to 11p.m. found to be the most (53.22%) accident prone time and

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majority (33.06%) of accident occurred at Kalyani expressway, the adjacent state highway. Wet road condition was found to be the one of the major cause of accident in the rainy season. Majority (50.98%) of the victims also complained about the poor road condition which may be the main cause the accident.

Out of total 124 in 56.5% cases drivers does not maintain the traffic rule. Among the all victims 137(38.6%) were pedestrian and among 137 pedestrian 44(32.12%) did not obey the traffic rule. Four-wheeler were found more prone to disobeying traffic rule with three wheeler and buses follows closely. Only six drivers admitted that they had taken alcohol at that very day before the accident happened but that could not be confirmed in absence of breath analyzer. All the data collected by interview technique cannot be corroborated with police record which may give space for non-identification of falsified or missed data. Among the all victims 25.92% were released after given first-aid and ask for follow-up and 48.73% were hospitalized for further evaluation and treatment (Table-4). Detailed treatment record and end out-come was not in the scope of the study and can be used for further study.

DISCUSSION: The present study revealed that tendency of accident was more among the male and age group of 20 to 29years which is consistent with other study.^{10, 11,12 -13,14-17} This result reflects the male dominance in driving and outdoor activities. Also the age group involved may indicate the reluctantness and experimental mentality of the post-adolescent people along with fewer adherences to the social and legal rules. Person with below secondary education were found to be more victimized in accident in the present study which is same as other study.^{11,18} Though no statistical association was calculated in the study it may be hypothesized that education may have a major influence in occurrences of accident. Skilled workers like drivers were found as the major victim of the accident in the present study as in other study¹⁸ may be inconclusive of any inference as they were the integral part of the mechanism of road traffic accident which may reflect as bias.

Occurrences of accident in rainy season as found in the present study may differ with other studies^{10,11,14} but it may rationalized by the poor road conditions and significant traffic load in the area. Majority of the victim also blame the poor road condition for the occurrences of accident in the present study which corroborate with earlier conclusion. The timing of 6 p.m. to 11p.m. was found accident prone time zone in the present study which found quite similar with other study^{10,11} which may be due to high traffic load and unavailability of emergency service in other health facility in the locality at that particular time. The present study shows two wheeler were more prone to accident like other studies^{11,19} may be due to reckless driving, less enclosed protection portion that other vehicles and common mode of transportation in the specified area. In the present study major cause of accident found not obeying the traffic rule also consistent with the findings of other studies. Some study¹⁰ show the influences of alcohol are quite higher among the victims but in present study the number is negligible. It may due to the false history giving by the victims as the data was not cross checked with police record. Present study also indicates high incidence of severe or external injuries among the victims which is similar with results of other study.²⁰

CONCLUSION: The result of present study shows epidemiological characteristics of accident of Kalyani area which may conclude with further hypothesis and formulation of area specific preventive measures to reduce the occurrence and impact accident. The first and foremost steps should be giving the specific education regarding causation, prevention, health impact, economic impact to the identified (Male, Age: 20-29 years) high risk population. Primary road safety manual should be prepared and exercised through school based education. Adequate signage, poster, traffic rules, direction indicator and other traffic maintaining equipment should be installed strategically in all risk prone area. Local

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administrative authorities should actively regulate the local public transportation and implement the stringent traffic rules.

Implementation of behavior change communication and life style modification may take into consideration specially addressing the young generation. As poor road conditions found to be the main cause of accidents immediate action should be taken for betterment of those from the appropriate authorities after careful inspection. A detailed scrutiny is needed for distribution of driving license and special drive should be organized to identify the alcohol user with specialized instruments like breath analyzer.

This study gives information about basic epidemiological features of accidents which can be corroborated with further studies with more robust hypothesis and more detailed data collection with statistical analysis.

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Age (Yrs)	Male	%	Female	%
0-9	13	4.3	9	17.3
10-19	58	19.1	14	26.9
20-29	95	31.4	10	19.2
30-39	47	15.5	5	9.6
40-49	45	14.9	6	11.5
50-59	23	7.6	4	7.7
60-69	18	5.9	2	3.8
>=70	4	1.3	2	3.8

Table 1: Distribution of victims according to age and sex

Level of education	Number	%
Illiterate	42	11.8
Primary	63	17.7
Middle	118	33.2
Secondary	60	16.9
Higher Secondary	42	11.8
Graduate & Higher	30	8.5

Table 2: Distribution of victims according to education level

Traffic rule Maintained		Total	%
Two Wheeler	23	84	27.4
Four Wheeler	16	20	80.0
Three Wheeler	9	13	69.2
Bus	2	3	66.7
Train	4	4	100.0

Table 3: Distribution of vehicles involved according to the maintenance of traffic rule

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Primary Treatment	Number	%
First aid	92	25.92
In observation	90	25.35
Hospitalized	173	48.73

Table 4: Distribution of victims according to Initial treatment

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