INJURY PATTERN AMONG NON-FATAL ROAD TRAFFIC ACCIDENT CASES: A CROSS-SECTIONAL STUDY IN CENTRAL INDIA

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ABSTRACT

RESEARCH QUESTION: *What is the pattern of injuries among non-fatal cases of road traffic accidents?* **OBJECTIVE:** *To study the pattern of injuries among non-fatal cases of road traffic accidents.* **STUDY DESIGN:** *Cross-sectional study.* **SETTING:** *Nagpur, a city in central India.* **PARTICIPANTS:** *423 non-fatal cases of road traffic accidents reporting for treatment to Indira Gandhi Medical College, Nagpur during 1999-2000.* **STUDY VARIABLES:** *Demographic characteristics, accident characteristics.* **STATISTICAL ANALYSIS:** *Percentages, proportions, Chi-square test.* **RESULTS:** *Out of total 423 subjects, 363 (85.8%) were male while only 60 (14.2%) were female subjects. Majority of the victims (75%) were in the age group 18- 37 years. Sideways collision was the most common type of accident seen in 269 (63.59%) cases. Two wheelers and LMV were the common vehicle being involved in accidents (69.97%) and these accidents were almost equally distributed in both half of the day. Fracture of the bones was the common injury afflicted to the victims followed by multiple injuries like blunt injury, abrasions and lacerations. Lower extremity was involved in 192 (45.39%) cases while multiple sites were affected in 114 (26.95%) cases.* **CONCLUSIONS:** *In the present study, the fractures were the commonest injury among the victims of non-fatal road traffic accidents.*

KEY WORDS: *Injury pattern, Non-fatal RTA, Central India*

INTRODUCTION

The process of rapid and unplanned urbanization has resulted in an unprecedented revolution in the growth of motor vehicles worldwide. The alarming increase in morbidity and mortality owing to road traffic accidents over the past few decades is a matter of great

concern globally. Currently motor vehicle accidents rank ninth in order of disease burden and are projected to be ranked third in the year 2020. Worldwide, the number of people killed in road traffic crashes each year is estimated at almost 1.2 million, while the number injured could be as high as 50 million.^[1]

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In India, over 80,000 persons die in the traffic crashes annually, over 1.2 million are injured seriously and about 300000 disabled permanently. In India, for individuals more than 4 years of age, more life years are lost due to traffic crashes than due to cardiovascular diseases or neoplasms.^[2,3] While the mortality data could be available with little effort, the data on non-fatal victims suffering from various types of injuries is very difficult as it depends on to which health care unit the victim reports for treatment. However as these injuries depend on number of factors like type of accident, colliding vehicle, site of impact, etc., their study is important for setting priorities for the prevention of such injuries. Very few studies have attempted to study the pattern of injuries in non-fatal accident victims in the Indian cities, particularly in Central India. Thus the present cross-sectional study was carried out to understand the pattern of injuries in non-fatal road traffic accident cases.

MATERIALS AND METHODS

The present cross sectional study was carried out at Indira Gandhi Medical College, Nagpur. All the non-fatal cases of road traffic accidents reporting to Indira Gandhi Medical College, Nagpur for treatment during 1999-2000 were included in the study. The information about the patients admitted as cases of road traffic accidents was obtained from the records of Out Patient Department of the hospital daily and then these patients were contacted in the wards. Thus the study included a total of 423 victims of road traffic accidents. Using interview technique as tool for data collection, the demographic and injury characteristics were recorded on a pre-designed proforma.

The site of injury was recorded as reported in the case sheets of the patients by the specialists. The statistical analysis included calculation of percentages and proportions and application of test of significance like Chi-square test and t-test.

RESULTS

The distribution of study subject according to the age and sex is depicted in Table 1. Out of total 423 subjects, 363 (85.8%) were male while only 60 (14.2%) were female subjects. Thus a male: female ratio of 6:1 was observed. It can be observed from the table that majority of the victims were in the age group 18-37 years constituting about three fourth of the study victims while only 76 (17.97%) cases were aged more than 37 years.

The distribution of study subjects according to accident and injury characteristics is shown in Table 2. Sideways collision of two vehicles was the most common type of accident seen in the study being observed in 269 (63.59%) cases. Two wheelers and light motor vehicles were the common vehicle being involved in accidents (69.97%) and the accidents were more common during the daytime. Fracture of the bones was the common injury afflicted to the victims followed by multiple injuries like

Table 1: Age and sex- wise distribution of study subjects

Age-groups	Male	Female	Total
≤17	27 (77.4)	7 (22.6)	34 (8.04)
18-27	121 (82.3)	26 (17.7)	147 (34.75)
28-37	147 (88.6)	19 (11.4)	166 (39.24)
38-47	52 (89.7)	6 (10.3)	58 (13.72)
48-57	12 (92.3)	1 (7.7)	13 (3.07)
≥58	4 (80.0)	1 (20.0)	5 (1.18)
Total	363 (85.8)	60 (14.2)	423

Table 2: Distribution of study subjects according to accident characteristics

Characteristics	Number (%)
Colliding vehicle	
Bicycles	18 (4.25)
Two wheelers (motorized)	114 (26.95)
Light Motor Vehicle	182 (43.02)
Heavy Motor Vehicle	83 (19.62)
Others	26 (6.14)
Type of accident	
Head on	95 (22.45)
Sideways	269 (63.59)
Others	59 (13.94)
Type of Injury	
Blunt	60 (14.18)
Fracture	279 (65.95)
Lacerated	4 (0.23)
Multiple	80 (18.91)
Site of injury	
Upper extremity	57 (13.47)
Lower extremity	192 (45.39)
Head, Neck, Face	60 (14.18)
Multiple sites	114 (26.96)
Time of accident	
Day (6 am to 6 pm)	225 (53.19)
Day (6 pm to 6 am)	198 (46.81)

blunt injury, abrasions and lacerations. The site of the body mostly affected by injury included lower extremity in 192 (45.39%) cases and multiple sites in 114 (26.95%) cases.

DISCUSSION

The present cross sectional study carried out in the Central India revealed that most of the accidents occur in the age group of 18-37 years of population. This results in the double loss to the country. Firstly expenditure is incurred in the treatment of these victims and secondly being the most productive age group, it results in huge productive man-days lost. Earlier studies have also reported a higher incidence of road traffic accidents in similar age groups.^[4-7] The higher incidence of accidents in these age groups can be attributed to the risk taking behavior of youths.

The male: female ratio of 6:1 can be attributed to the fact that proportion of males as compared to females is more and in our society as males are the bread earners for the family and therefore involved usually in outdoor activities exposing themselves to accidents. Frank et al also observed a higher male: female ratio.^[8]

In the present study, motorized two-wheelers and light motor vehicles were the common vehicles involved in road traffic accidents. This could be attributed to the fact that the present study is carried out in an urban area where these types of vehicles are most common. Similar findings were also observed in studies carried out in other cities of the country.^[4-6,9]

The sideways accidents were found to be common and the commonest injury was fracture of bones particularly of lower extremity. This can be due to the interplay of gravitational force and velocity of the vehicle at the time of accidents, resulting in generation of kinetic energy that in turn results in fractures. The occurrence of fractures was more common than other injuries, when compared according to the different types of accidents viz. head on, sideways and others. This difference was statistically highly significant ($\chi^2=25.26$; $df=6$, $P<0.0001$). Drysdale WF^[10] in his study documented that physicians should be alert to the fact that persons injured in motorcycle collision commonly sustain multiple fractures. Similar findings were also reported by another study.^[11]

When temporal distribution of the accidents was studied it was observed that 225 (53.19%) accidents took place in the daytime. This may

be because of the increased activities on road during daytime such as commercial activities, activities like attending the schools, colleges and offices. This increases the probability of the accidents in the daytime. The difference in the occurrence of accidents according to two halves of the day was found to be statistically significant ($\chi^2=14.8$; $df=2$, $P<0.001$). Other studies also substantiate these findings.^[12-13]

Thus to conclude from the present study, it was found that fractures were the commonest injury among the victims of non-fatal road traffic accidents which commonly involved motorized two wheelers and light motor vehicles.

On the basis of study findings it is recommended that strict licensure procedure should be followed and minimum level of education regarding road safety should be imparted especially to the young age group during giving license. Also efforts should be made to minimize congestion on road particularly during daytime with the help of traffic police.

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