DISTRIBUTION OF NON-FATAL ROAD TRAFFIC ACCIDENT CASES ADMITTED IN TERTIARY CARE CENTRE IN CENTRAL INDIA- A CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND

In the background of high epidemiologic proportions of road traffic accidents and the fact that very few exploratory studies were reported from central India, the present study was undertaken to study distribution of non-fatal road traffic accident according to time, place and person.

Aims and Objectives- To study distribution of non-fatal road traffic accident cases admitted in tertiary care hospital according to time, place and person.

MATERIALS AND METHODS

Study Place- Tertiary care hospital from Central India. Study Type- Cross-sectional study. Study Period- One year (May 2014 to May 2015). Distribution of study subjects according to time, place and person was recorded in the proforma. Statistical analysis was carried out with the help of software Epi Info version 7.2. Results were presented in percentages. Chi-square test was used as test of significance.

RESULTS

In temporal distribution, it was seen that 44% road traffic accident cases occurred in the evening and maximum road traffic accident cases occurred on weekends, i.e. on Saturdays (16.72%) and on Sundays (17.39%). 40.67% of road traffic accident cases occurred in rainy season (June to September). In zone wise distribution of accidents which occurred inside city, 36.51% were seen in north zone. It was observed that in majority of accident cases, mode of transport was motorcycle (49.33%). Males were significantly higher than females among the motorcycle occupants as compared to other modes of transport ($X^2= 6.76$, $DF= 1$, $p<0.01$).

CONCLUSION

The present study clearly demonstrated that several factors such as rainy season, evening hours, weekends i.e. Saturday and Sunday, north zone of city was found to be more common in road traffic accidents. In majority of accident cases, mode of transport was motorcycle.

KEYWORDS

Distribution, Road Traffic Accidents, Time, Place, Person.

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BACKGROUND

"Every six seconds someone is killed or seriously injured on the world's roads. We simply cannot go on like this." Mr. David Cameron, Prime Minister of the United Kingdom of Great Britain and Northern Ireland.⁽¹⁾

From high level ministerial gathering to expert symposia, press conferences, drawing competitions and cycling races, more than 400 events took place in all corners of world making official start of decade of action for road safety 2011-2020.⁽¹⁾

Although, in the year 2012, Maharashtra had the highest number of registered vehicles in the country, but highest number of deaths due to road accidents during this year were reported in Tamilnadu (16,175) followed by Uttar Pradesh (15,109), Andhra Pradesh (14,966) and Maharashtra (13,936).⁽²⁾

Hence, in the background of high epidemiologic proportions of road traffic accidents and the fact that very few exploratory studies were reported from central India, the present study was undertaken to study distribution of non-fatal road traffic accident according to time, place and person.

MATERIALS AND METHODS

Study Place- Tertiary care hospital from Central India. Study type- A cross-sectional study. Study period- One year (May 2014 to May 2015). Approval from Institutional Ethics Committee was taken before initiation of study.

Study Population

Road traffic accident cases admitted in tertiary care hospital in city during the period of one year (May 2014 to May 2015) were included in the study with following inclusion and exclusion criteria.

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Inclusion Criteria

1. Road traffic accident cases admitted in hospital.
2. Road traffic accident cases who were conscious and co-operative.
3. Road traffic accident cases who had given written informed consent.

Exclusion Criteria

1. Road traffic accident cases who were admitted in surgical intensive care unit (SICU) of hospital.
2. Road traffic accident cases who took discharge against medical advice (DAMA).
3. Road traffic accident cases brought dead in casualty department.
4. Road traffic accident cases who were unable to participate in the study due to impaired health status.

Distribution of road traffic accident cases reported to casualty department of tertiary care hospital was recorded on each day to identify accident cases admitted in hospital on that day. During data collection of one year, distribution of road traffic accident cases reported in casualty was as follows.

Statistical Analysis

Statistical analysis was carried out with the help of software Epi Info version 7.2. Results were presented in percentages and numbers. Chi-square test was used as test of significance. P value less than 0.05 was considered for level of significance.

Distribution of Road Traffic Accident Cases Reported at Casualty	Number	%
Managed on OPD basis	1877	70.86
Discharged against medical advice	196	7.40
Admitted in ward	481	18.16
Admitted in Surgical intensive care unit	27	1.02
Brought dead	68	2.56
Total	2649	100

Table 1. Distribution of Road Traffic Accident cases reported to Casualty

There were total 481 road traffic accident cases admitted in hospital during the period of one year. Distribution of these 481 cases admitted in hospital was as follows: Out of these 481 road traffic accident cases of 300 were interviewed and examined for the study.

Distribution of Admitted Road Traffic Accident Cases	Number	Percentage
Number of cases interviewed	300	62.37
Were not able to participate in the study	131	27.13
Consent not given	50	10.50
Total	481	100

Table 2. Distribution of 481 Road Traffic Accident cases admitted in Hospital

Study Methodology

A pre-tested proforma was used for collecting relevant information from study subjects by direct interview method. Information regarding distribution of road traffic accidents according to time, place and person was recorded in the proforma.

RESULTS

The present cross-sectional study was carried out in a tertiary care hospital in central India. Three hundred road traffic accident cases were studied in detail with regard to their distribution according to time, place and person.

Time of Occurrence of the Accidents	Category of Study Subjects							
	Drivers		Passengers		Pedestrians		Total	
	No.	%	No.	%	No.	%	No.	%
Night (12 midnight to 5:59 am)	5	3.94	9	10	2	2.41	16	5.33
Morning (6 am to 11:59 am)	20	15.74	14	15.56	16	19.28	50	16.67
After noon (12 noon to 5:59 pm)	51	40.16	25	27.77	26	31.33	102	34
Evening (6 pm to 11:59 pm)	51	40.16	42	46.67	39	46.98	132	44
Total	127	100	90	100	83	100	300	100

Table 3. Distribution of Study Subjects according to Time of occurrence of the Accidents

Above table shows that maximum road traffic accident cases met with accident at the evening was 132 (44%). This was followed by afternoon of 102 (34%), morning of 50 (16.67%) and night of 16 (5.33%).

Day of Accident	Category of Subjects							
	Drivers		Passengers		Pedestrians		Total	
	No.	%	No.	%	No.	%	No.	%
Monday	20	15.75	14	15.56	11	13.25	45	15.05
Tuesday	19	14.95	11	12.23	13	15.66	43	14.38
Wednesday	21	16.54	13	14.44	10	12.05	44	14.72
Thursday	13	10.24	10	11.11	04	4.82	27	9.03
Friday	12	9.45	12	13.33	14	16.87	38	12.71
Saturday	20	15.75	12	13.33	19	22.89	51	16.72
Sunday	22	17.32	18	20	12	14.46	52	17.39
Total	127	100	90	100	83	100	300	100

Table 4. Distribution of Study Subjects according to Day of Accident

Table No. 4 shows that maximum road traffic accident cases were seen on weekends, i.e. on Sunday 52 (17.39%), followed by Saturday 51 (16.72%).

Season of the Year	Category of Study Subject							
	Drivers		Passengers		Pedestrians		Total	
	No.	%	No.	%	No.	%	No.	%
February to May (Summer)	43	33.86	33	36.67	28	33.73	104	34.67
June to September (Rainy)	47	37.01	44	48.89	31	37.35	122	40.67
October to January (Winter)	37	29.13	13	14.44	24	28.92	74	24.66
Total	127	100	90	100	83	100	300	100

Table 5. Distribution of Study Subjects according to Seasons of the Year

Table No. 5 shows maximum number of road traffic accident cases occurred in rainy season (June to September)

122 (40.67%) followed by summer season (February to May) 104 (34.67%) and winter season (October to January) 74 (24.66%).

City Zones	Number	Percentage
East	20	6.67
West	36	12.00
North	65	21.67
South	06	2.00
Central	41	13.67
Southwest	10	3.33
Outside city	76	25.33
Outside district	46	15.33
Total	300	100
Table 6. Distribution of Study Subjects according to Zones of the City		

*These zones are according to parliament constituency zones of the city.

Table No. 6 shows that out of total accidents which occurred inside city, maximum were seen in north zone i.e. 65 (36.51%) followed by central zone 41 (23.03%), west zone 36 (20.22%), east zone 20 (11.24%), south-west zone 10 (5.63%), and south zone 6 (3.37%).

Mode of Transport of Study Subjects	Male		Female		Total	
	No.	%	No.	%	No.	%
Pedestrian	62	24.51	21	45.68	83	26.67
Pedal-Cyclist	29	11.46	5	10.64	34	12.33
Motorcycle	133	52.57	15	31.92	148	49.33
Other	29	11.46	6	11.76	35	11.67
Total	253	100	53	100	300	100

Table 7 shows that among majority of accident cases mode of transport was motorcycle 148 (49.33%) followed by pedestrian 83 (26.67%), other vehicles 35 (11.67%) and pedal-cyclist 34 (11.33%). Males having motorcycle 133 (52.57%) as mode of transport are significantly higher as compared to males using rest of the modes of transport ($X^2=6.76$, $DF=1$, $p < 0.01$).

DISCUSSION

The present study showed that maximum road traffic accident cases met with accident in the evening (6 pm to 11:59 pm) (44%). This is followed by afternoon (12 noon to 5:59 pm) (34%), morning (6 am to 11:59 am) (16.67%) and night (12 midnight to 5:59 am) (5.33%). This may be attributed to decreased visibility and maximum traffic congestion in the evening hours. Lot of variation was observed in distribution of accidents according to time in a number of studies reviewed. Some studies showed finding similar to present study. E Ravikiran et al (2003)⁽³⁾ found that maximum (33.5%) of the accidents occurred in the evening and the minimum 13.0% occurred in the night. Ghosh SK et al (2004)⁽⁴⁾ observed that maximum number of accidents occurred during 6 pm to 10 pm and may be attributed to the combined rush in evening along with poor lighting. Singh A et al (2011)⁽⁵⁾ observed that most of the accidents (40.15%) occurred in the evening (6 pm – 12 midnight).

The present study showed that maximum road traffic accident cases were seen on weekends, i.e. on Sunday (17.39%) followed by Saturday (16.72%). As weekends are

holidays this may be attributed to more congestion on roads in weekends. There were some studies which showed similar results. Jha N et al (2004)⁽⁶⁾ observed that the highest number of accidents (17.1%) took place on Sundays. Jha S et al (2010)⁽⁷⁾ found that most of the accidents irrespective of the cause occurred on Saturday (24.6%). Aggarwal A (2012)⁽⁸⁾ found that more than half of accidents had occurred on Saturday and Sunday.

In the present study, it was observed that maximum number of road traffic accident cases occurred in rainy season (June to September) (40.67%) followed by summer season (February to May) (34.67%) and winter season (October to January) (24.66%). There was variation seen in individual studies in distribution of accident cases according to months of year. Also variation was observed in seasons of the year in different regions of country. There were some studies with similar results. E Ravikiran et al (2003)⁽³⁾ observed that the maximum number of accidents (48.5%) occurred in rainy season followed by 33.5% in winter and the least 18.0% in summer. Pathak MSM et al (2013) observed that maximum cases (46.7%) took place during monsoons (July - October).

The present study showed that maximum accident cases i.e. 59.33% occurred inside the city, while 40.67% accident cases occurred outside the city. Out of total accidents which occurred inside city, maximum were seen in north zone (36.51%) followed by central zone (23.03%), west zone (20.22%), east zone (11.24%), south-west zone 10 (5.63%) and south zone (3.37%). Maximum cases were seen in north zone of city and this may be attributed to the fact that interstate highway which always has congestion passes through this zone. Also, the north zone was near to the tertiary care hospital in which study was carried out.

The present study showed that among majority of accident cases, mode of transport was motorcycle (49.33%) followed by pedestrian (26.67%), other vehicles (11.67%) and pedal-cyclist (11.33%). Males having motorcycle (52.57%) as mode of transport were significantly higher as compared to males using rest of the modes of transport. Two-wheelers involved in road accidents were 49.33% and this large proportion may be attributed to the fact that two wheelers have to share scarce road space with motorised vehicles of different engine power and speed resulting in serious conflicts within traffic flows. Similar findings were given by some studies. Odero W (1997)⁽⁹⁾ found that pedal cyclists and motorcyclists killed ranked first in India and Surinam. Gururaj G (2008)⁽¹⁰⁾ found that vast majority of those killed and injured were pedestrians, motorcycle riders and bicyclists. WHO Global Report on Road Safety (2009)⁽¹¹⁾ showed that pedestrians, cyclists, motorcycle riders and their passengers accounted for 46% of global road traffic deaths. Mohan D (2009)⁽¹²⁾ published a paper on road accidents in India and mentioned that vulnerable road users (pedestrians, bicyclists and motorised two-wheeler riders) accounted for 84% of deaths in Delhi and 67% on highways. Kelkar A (2011)⁽¹³⁾ mentioned that the vulnerable road users such as the pedestrians, users of non-motorised transport, cyclists and users of two wheeled motorised vehicles accounted for a large majority of the accident victims in India. Chauhan A (2014)⁽¹⁴⁾ found that a high proportion of patients of road traffic injuries were either motorised two wheelers driver i.e.

43.1% or pillion riders i.e. 15.4%. Pedestrians were 14.2% and Pedal cyclists were 4.9%.

CONCLUSION

The present study clearly demonstrated that several factors such as rainy season, evening hours, weekends i.e. Saturday and Sunday, north zone of city was found to be more common in road traffic accidents. In majority of accident cases, mode of transport was motorcycle.

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