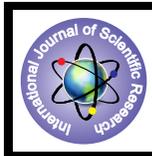


Evaluation of All Road Traffic Accidents Cases Reaching to a Tertiary Care Center From a State Highway



Medical Science

KEYWORDS : Road Traffic Accidents (RTA), Retrospective Evaluation, State Highway

Dr. Pradip Kumar Bhattacharya

MD, FICCM, FCCCM Department of Anaesthesiology Chirayu Medical College & Hospital Bhopal-Indore highway, Near Bairagarh, Bhopal (MP) 462030

Dr. Ajay Goenka

MD Department of Medicine Chirayu Medical College & Hospital Bhopal-Indore highway, Near Bairagarh, Bhopal (MP) 462030

Mrs. Navya Guwalani

Bsc. (hons) Zoology, P.G. in Clinical Research Department of Research Chirayu Medical College & Hospital Bhopal-Indore highway, Near Bairagarh, Bhopal (MP) 462030

ABSTRACT

Road Traffic Accident (RTA) is one among the top five causes of morbidity and mortality in South-East Asian countries as well as India and is the third major unnatural preventable deaths amongst all. Our aim is Retrospective evaluation of factor's involved and common associations in victims of RTA in a state highway. This retrospective analysis was conducted at Chirayu Medical College and Hospital (CMCH); situated on the Bhopal- Indore State Highway. The data of 450 RTA victims were collected from Jan 2013-Dec 2014. Important parameters which were evaluated are socio-demographic profile, site and severity of injury, type of vehicle, time and weather of RTA, time to report to hospital, alcohol consumption and pre-existing disease conditions. Most of the victims were young (45.77%) driving two wheeler (82.44%) in the age group of 16-30. Majority of the victims had serious injury (33.33%) where head was the most common site of injury (56%). Most common time duration of occurrence of RTA was 12.00 pm to 12.00 am (68.66%) and majority of the victims belonged to rural population (50.44%).

INTRODUCTION

Road Traffic accidents (RTAs) have emerged as a major global public health problem of this century and are now recognized as “veritable neglected pandemic”[2]. The problem is so severe that, by 2020, it is projected that road traffic disability-adjusted life years (DALYs) lost will move from being the 9th leading cause of disability-adjusted life years lost to the 3rd leading cause in the world and will be 2nd leading cause in developing countries.[4]

An accident has been defined as: “an unexpected, unplanned occurrence which may involve injury[3]. WHO Advisor Group in 1956 defined accident as an “unpremeditated event resulting in recognizable damage”[3]. Accidents have their own natural history and follow the same epidemiological pattern as any other disease - that is, the agent, the host and the environment interacting together to produce injury or damage. They occur more frequently in certain age-groups, at certain time of day and week and at certain localities. Susceptibility is increased by the effect of alcohol and other drugs as well as physiological state such as fatigue. Lastly, a majority of accidents are preventable.

Chirayu Medical College and Hospital is a tertiary care referral center situated over Bhopal –Indore highway where most of RTA cases between Bhopal and Sehore are referred. This constitutes a population of around 5 lakhs. In this analysis we have evaluated all the cases referred to this institution during a span of 2 years period.

The purpose of this study was to find out the common causes related to all factors evaluated in this study and to find out if any preventive measures can be taken to avoid these accidents and also to communicate a message to a society for all avoidable factors which will help in reducing the rate of accidents in a highway.

MATERIALS AND METHODS

After due clearance from the research committee of Chirayu Medical College and Hospital, this retrospective analysis was started. All case files of trauma admitted between Jan 2013-Dec 2014 were screened out from hospital database and cross checked with manual entrance register in emergency department and ICU. All trauma case files between the above period were retrieved from medical record section through proper

channel and all data's mentioned in case record format were extracted from individual files, following which observations and results were laid down.

For the purpose of this retrospective analysis, an RTA was defined as an accident, which took place on the road between two or more objects, in which one is any kind of moving vehicle and the other a human being. Any injury on the road without involvement of a vehicle (e.g. a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (e.g. persons getting injured while washing or loading a vehicle) were excluded from the study. A total of 589 victims of RTA were reported in the emergency during two year period, out of which 450 were inpatients and 139 were outpatients. Outpatients were also excluded from this analysis.

This data was collected from medical record section after review of individual case sheets. The collected data was entered into MS Excel. Interpretation of the collected data was done by using appropriate statistical methods like percentages and proportions.

The Injury Severity Score (ISS) is an established medical score to assess trauma severity. It correlates with mortality, morbidity and hospitalization time after trauma. It is used to define the term major trauma (serious injury).

The Abbreviated Injury Scale (AIS) is an anatomically based consensus-derived global severity scoring system that classifies each injury in everybody region according to its relative severity on a six point ordinal scale:

- Minor
- Moderate
- Serious
- Severe
- Critical
- Maximal (currently untreatable)

RESULTS

1. SOCIO DEMOGRAPHIC PROFILE

A total of 450 victims were included in this retrospective evaluation. Majority of the victims were in the age group of 16-30 i.e. 206 (45.77%).346 (76.88 %) of the victims were males. A high percentage of both 10 (45.45%) fatal cases out of total 22 cases and non fatal 196 (45.79%) cases out of total 428 cases were observed

from the age group 16-30. Majority of the road traffic accidents i.e. 371 (82.44%) occurred due to two wheeler. Out of 22 fatal cases, 19 (86.36%) were due to two wheeler and 3 (13.63%) due to Four wheeler. Victims from rural areas (50.44%) were more as compared to urban areas (29.55%) and semi-urban areas (20%). (Table-1)

Table-1: Distribution of victims according to socio-demographic profile

AGE GROUP	0-15	15-30	31-45	46-60	61 AND ABOVE	TOTAL NO. OF VICTIMS (n)=450
SEX						
MALE	16	176	97	46	11	346 (76.88%)
FEMALE	09	30	33	25	07	104 (23.11%)
Type of vehicle						
TWO WHEELER	21	178	111	47	14	371 (82.44%)
FOUR WHEELER	04	28	18	24	04	78 (17.55%)
RESIDENCE						
URBAN	05	65	39	23	01	133 (29.55%)
SEMI-URBAN	07	39	24	16	04	90 (20%)
RURAL	13	102	67	32	13	227 (50.44%)
TOTAL NO. OF VICTIMS (n)=450	25 (5.55%)	206 (45.77%)	130 (28.88%)	71 (15.77%)	18 (4%)	n=450

2. SITE AND SEVERITY OF INJURY

On analyzing the site of injuries, it was observed that head (56%) was the most common site of injury followed by lower limbs (26%). (Figure-1) Out of 22 fatal cases, 20 cases (90.90%) sustained head injury. Out of 450 patients (49.33%) victims were managed conservatively, (29.33%) victims underwent surgery, (4.88%) were fatal cases, (16.44%) victims were left against medical advice (LAMA) and (14.44%) patients were admitted in ICU. (Figure-2)

Figure 1: Distribution of Victims According to the Site of Injury.

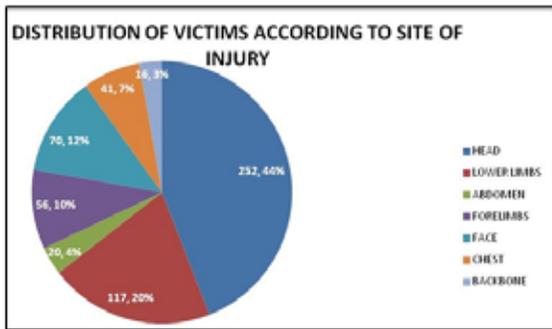
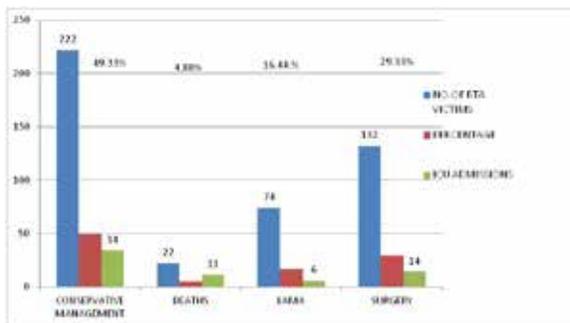
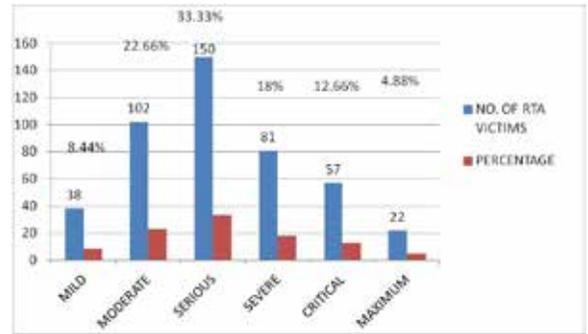


Figure-2: Distribution of Victims According To Their Treatment



A total of 132 victims required surgical intervention out of which 58 (40.55%) victims underwent Open Reduction and Internal fixation (ORIF) and 25 (17.48%) victims underwent Closed Reduction and internal fixation (CRIF). The mortality rate of this retrospective evaluation was 4.88% where most of the injuries were serious (33.33%) followed by moderate injuries (22.66%) (Figure-3)

Figure-3: Distribution of Patients According To Severity of Accident



A total of 183 victims had fractures in which the most common site of fracture was the lower limb (42.62%), followed by upper limb (16.39%), and facial injuries (14.20%).

3. TYPE OF VICTIMS, TIME AND WEATHER OF RTA

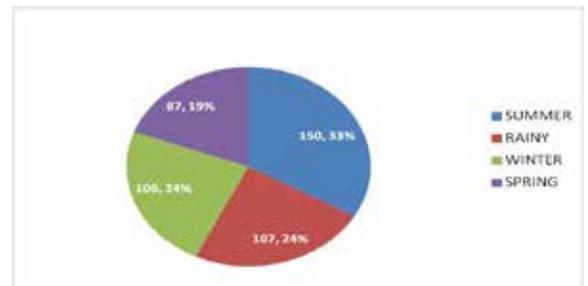
Out of total 450 victims, 278 (61.77%) were drivers, 103 (22.88%) were passengers, 48 (10.66%) were pillions, 21 (4.66%) were pedestrians. Majority of the accidents took place between 12.00 pm -12.00 am i.e. 68.66% during second half of the day and first half of night. (Table-2)

In the present study, it was observed that majority (33.33%) of road traffic accidents occurred during summers followed by rainy season (23.55%).(Figure-4)

Table 2: Distribution of patients according to type of victims and time of RTA

TYPE OF VICTIMS	TIME OF RTA				Total No. of Victims (n)=450
	12:00 AM-6:00AM	6:01AM-12:00PM	12:01PM-6:00 PM	6:01PM-11:59PM	
DRIVERS	20 (58.82%)	65 (60.74%)	81 (82.25%)	112 (72.72%)	278 (61.77%)
PASSENGERS	14 (41.17%)	25 (23.36%)	30 (33.22%)	28 (33.18%)	105 (22.88%)
PILLIONS	00 (0%)	08 (7.47%)	36 (38.66%)	12 (7.79%)	48 (10.66%)
PEDESTRIAN	00 (0%)	09 (8.41%)	10 (10.45%)	02 (3.29%)	21 (4.66%)
Total No. of Victims (n)	34 (7.55%)	107 (23.77%)	150 (33.44%)	154 (34.22%)	n=450

Figure-4: Distribution of Victims According to Season



4. TIME TO REPORT TO THE HOSPITAL

Only 7.33 % victims were admitted to the hospital within 1 hour, 30.88% victims were admitted beyond 6 hours and majority of the victims 61.77% within 6 hours of the accident. (Table-3)

Table-3: Distribution of patients in relation to admission to hospital.

TIME TO REPORT TO HOSPITAL	NO. OF RTA VICTIMS	PERCENTAGE	MORTALITY RATE
0-1 HOUR	33	7.33%	0.22%
1-6 HOURS	278	61.77%	2.22%
BEYOND 6 HOURS	139	30.88%	2.44%

5. ALCOHOL CONSUMPTION AND PRE-EXISTING DISEASE CONDITIONS

The data was collected from medical record section after review of individual case sheet, out of 278 drivers in the present study 46 (10.22%) were found to have some evidence of alcohol consumption. Out of the total study population, 101 (23.55%, cumulative percentage) were found to have disease conditions like type II diabetes mellitus, hypertension, bronchial asthma. (Table-4)

Table-4: Distribution of victims according to alcohol consumption and disease condition

ALCOHOL CONSUMPTION	NO.OF RTA VICTIMS	PERCENTAGE
YES	46	10.22%
NO	404	89.77%
DISEASE CONDITION	NO.OF RTA VICTIMS	CUMULATIVE PERCENTAGE
TYPE II DAIBETES MELLITUS	52	23.55%
HYPERTENSION	49	23.55%
BRONCHIAL ASTHAMA	05	23.55%

6. HOSPITAL STAY

The estimated total days lost in the present study was 3823 days in the form of hospital stay with an average of 8.49 days per each case. The longest period was recorded to be 108 days and the shortest 6 hours.

DISCUSSION

The present retrospective analysis suggests that majority of the RTA victims were in the age group of 16-30 years (45.77%) which is the most common age range for road traffic accidents as evidenced by other analysis also.5,6,7,10,12,13,14,15,17

Male preponderance over female in our analysis as well as other studies suggests that in country like India, vehicles are driven mostly by males as compared to females. Variable ratios observed in different studies were due to variability in the data collected from different locations of accidents.5,8,13,15

Accidents with two wheelers was a frequent finding in our evaluation and also the evaluation done by others.7,8,11,12,16A few studies however from Nepal and Delhi reported more pedestrians as victims which suggests more accidents in population densed areas as compared to highways. 9,14,15,17

Young age group as most common victims of road traffic accidents raises some important issues related to our Indian circumstances.

- Driving without license is very common in India especially in vulnerable age group in semi urban and small cities which needs to be discouraged both at administrative and society level.
- Freedom to drive without appropriate knowledge of road traffic rules suggests that licensing authorities have to re-think about their process of issuing license.
- Mass discouragement of driving without having proper knowledge, skill and license.
- Uninhibited promotion by parents/ guardians needs to be discouraged.

Rural people (50.44%),happened to be more victims as compared to urban people which further suggests that knowledge of road traffic rules and driving skills are further less in this group of population. Another reason is increased travel by two wheeler to urban cities by rural people in search of job and income without bothering for their own protection.

As a general rule, the mechanism of injury with two wheeler accidents affects the upper half of the body the most. Our analysis also suggests the same that head (56%) was the most common site of injury. Similar observations were found in other studies.10,14,15,16,17 Few studies have suggested abdominal injury

where four wheeler accidents was more common as compared to two wheeler. 11

Most accidents (68.66%) happened in the second half of the day and first half of night. This period is considered as a high traffic time for both highways and city roads.8,10,11,15

Most common seasons were summer and rainy seasons for the accidents. Our evaluation reveals that most of the accidents happened in summer season (33.33%) as compared to rainy season suggests that two wheeler driving is less commonly preferred in highways during rainy season.

We observed that alcohol intake is one of the contributing factor in road traffic accident , the percentage of which was 10.22% as compared to other studies conducted by Jha N (14.9 %),5, Pramod KV (1.9 %)8 Yadav BN (16.9 %)9, Abhishek S (18.01%)11, Ghosh PK (4.6 %)13

In view of less distance from the highway to our hospital, most of the victims (61.77%) reached our center within six hours of accident that is reflected on the overall survival of accident victims. The mortality was only 4.88% despite the percentage of serious injury cases were 33.33%. The average duration of hospital stay in our evaluation was 8.49 days.

Approximately 30% of our patients required surgical intervention for their management and only 14.44 % of patients required ICU admissions.

Despite most victims were in the age group of less than 30 years, we observed that 23.5% of the victims were suffering from Diabetes mellitus, Hypertension or Bronchial asthma. Whether the above findings was a contributing factor for RTA needs for further evaluation.

CONCLUSION

Accidents are a common occurrence in highways. Our retrospective analysis suggests that most victims are of young and productive age group who travel through two wheelers mostly from rural areas during the second half of day and first half of night during summer season. Most affected sites after accidents are either head or lower limb. One third of these patients report to the hospital with serious injuries .Most of these accidents can be avoided if driving without license is discouraged, the process of issuing license becomes more meticulous, use of protective gears, continuous up gradation of knowledge through education and uninhibited promotion by parents is stopped.

REFERENCE

1. Paden M, McGee K, Krug E. Injury: A leading cause of the global burden of disease. Geneva, Switzerland: World Health Organization; 2000.
2002. | 2. Dandona R, Mishra A. Death due to road traffic crashes in Hyderabad city in India: Need for strengthening surveillance Natl Med j India 2004;17:74-9. | 3. World Health Organization, World report on road traffic injury prevention. Geneva: WHO 2004; P 3-29. | 4. Murray CJL, Lopez AD: Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. 1997, 349:1498-1504. | 5. Jha N, Srinivasa DK, Roy G, Jagdish S, Minocha RK. Epidemiological study of road traffic accident cases: A study from South India. Indian J Community Med. 2004;29:20-5. | 6. Ganveer GB, Tiwari RR. Injury Pattern among non-fatal Road Traffic Accident cases: a cross sectional study in central India. Indian J Med Sci [serial online] 2005, [cited 2007 July 27]; 59(1), 9-12. | 7. Balogun JA, Abreojie OK. Pattern of road traffic accident cases in a Nigerian University Teaching Hospital between 1987 and 1990. Trop Med Hyg 1992; 95: 23-9. | 8. Pramod KV, Tewari KN. Epidemiology of Road Traffic injuries in Delhi: Result of a survey. Regional Health Forum. Delhi. WHO- SEAR 2004; 8 (1): 4-14 | 9. Jha N, Yadav BN, Karn A, Aggarwal A, Gautam AP. Epidemiological study of fatal head injury in road traffic accident cases: a study from BPKIHS, Dharan. Health Renaissance, May-Aug 2010; Vol 8 (No.2):97-101. | 10. B Mishra. Epidemiological study of road traffic accident cases from western Nepal. 2010: IJCM Vol -35: 115-121. | 11. Abhishek S. An Epidemiological study of road traffic accident cases at a tertiary care hospital in rural Haryana. 2011 IJCM Vol.23, No 2, 53-55. | 12. D. Sharma, A Study on road traffic accidents in Anand- Gujarat, Vol. 2 Issue 2 July-December 2011. | 13. Ghosh PK. Epidemiological study of the victims of vehicular accidents in Delhi. J of Indian Medical Association 1992; 90(12): 309-12. | 14. Mehta SP. An epidemiological study of road traffic accident cases admitted in Safdarjang Hospital, New Delhi, Indian Journal of Medical Research, 1968;56(4):456-466. | 15. Biswas G, Verma SK, Sharma JJ, Aggarwal NK. Pattern of Road Traffic Accidents in North East Delhi. Journal of Forensic Medicine & Toxicology; 2003; 20(1):27-32. | 16. Sahdev P, Laeque MD, Singh B and Dogra TD. Road Traffic Accidents in Delhi, causes, injury pattern and incidence of preventable deaths. Accid Anal Prev 1994; 26:12-18. | 17. Sathiyasekarn BWC. Accident trauma - A descriptive hospital study. J of the Royal Society of Health 1991:10-1.