pISSN 2349-3305 | eISSN 2349-2902

## **Original Research Article**

DOI: http://dx.doi.org/10.18203/2349-2902.isj20164477

# A study of injury characteristics in road traffic accidents by different road user category

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Received: 23 October 2016 Revised: 04 November 2016 Accepted: 21 November 2016

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#### **ABSTRACT**

**Background:** Trauma is one of the oldest subjects in medical science because it appeared just as early as human being came to the earth. At the same time trauma is also a novel subject, because trauma has been strikingly increasing with the high-speed development of economical construction, traffic transport and sharp increase of vehicles in number. Therefore, trauma is called the twin brother of the modem civilization. Accidents occur not only due to ignorance but also due to carelessness, thoughtlessness and over confidence. Human, vehicular and environmental factors play role before, during and after a road traffic accidents (RTA). Road traffic injuries are partially predictable and hence preventable.

**Methods:** this was prospective observational study in which all cases of road traffic accident victims admitted to the hospital (AVBRH) between July 2014 to September 2016, were analyzed statistically with respect to their demographic profile, injury characteristics and outcome.

**Results:** This study showed that motorcyclists were predominantly affected (77.3%) in RTA. Males (80.67%) in the working age group 21-40 years (64.66%) were most commonly affected leading to huge economic losses to their families. Majority RTA took place between 4pm to 12am (57.33 %), on Sundays and Saturday (41.66%) and during summer season (52.67%). Extremity injury (67%) was the most common injury followed by craniocerebral injuries (58.33%). Maximum mortality was seen in LMV/HMV occupants (25%).

**Conclusions:** Road traffic accidents are preventable. Strict traffic laws and penalties have to be imposed to curb this ever growing menace.

Keywords: Collision, Injuries, Road traffic accidents, Road user categories

#### INTRODUCTION

Trauma in terms of 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. <sup>1,2</sup> The global burden of RTIs continues to grow and promises to overtake tropical diseases as a leading cause of death in the developing world. RTIs ranked ninth in the ten leading causes of the global burden of disease, with respiratory infections and varying diseases

in the top rankings.<sup>3</sup> The World Health Organization (WHO) and the World Bank combined efforts to publish the World report on road traffic injury prevention, a result of a decade long discussion, to provide insight into the growing public health, economic, and social burdens caused by RTIs.<sup>4</sup> According to the global status report on road safety, RTIs have yielded an estimated US\$518 billion in global losses, costing governments between 1% and 3% of their gross national product (GNP).<sup>5</sup> Without global action, the outlook for the next few decades is far from promising. It is estimated that, despite a decrease of

30% in deaths related to RTIs in high-income countries, road traffic fatalities will continue to increase dramatically in low- and middle-income countries. With such high costs for such a preventable global problem, the world has taken notice. Still, considerably more tangible day to day action needs to be taken. According to the World Health Organization (WHO), road traffic injuries are the sixth leading cause of death in India with a greater share of hospitalization, deaths, disabilities and socio-economic losses in the young and middle-aged population. The present study is aimed to analyses the demographic features, injury pattern and outcome in different road-user categories.

#### **METHODS**

The study was conducted in tertiary health care centre - Acharya Vinoba Bhave Rural Hospital (AVBRH), Sawangi (Meghe), Wardha, Maharashtra, India.

Duration of study was from July 2014 to September 2016.

This was a prospective observational study carried out on road traffic accident patient admitted in Acharya Vinoba Bhave Rural Hospital (AVBRH), Jawaharlal Nehru Medical College, DMIMS, (DU), Sawangi, Wardha, Maharashtra, India.

Randomly selected 300 patients were selected for study.

#### Inclusion criteria

All patients who had sustained injuries resulting in immediate admission to hospital for three days or longer, admission to intensive care or high dependency unit, or death in our hospital.

#### Exclusion criteria

- Patient with isolated uncomplicated limb fractures
- Patients who died either at the scene or en route to the hospital are excluded from the study.

#### Methodology

The data collection for the trauma registry started immediately after a patient was admitted and continued on a daily basis. The data collection was based on:

- Mechanism of injury
- Physiological condition on admission (systolic and diastolic arterial pressure, heart rate, breathing rate, and Glasgow coma scale)
- Definitive anatomical injury diagnosis on discharge or death obtained from charts, radiology reports, or necropsies
- length of stay in the intensive care unit (ICU) and the hospital
- Final outcome.

For the purpose of analysis, patients were divided into three groups based on the road-user category: LMV/HMV occupants, motorcyclists, and pedestrians. The LMV/HMV occupants group included both the drivers and the passengers.

#### **RESULTS**

The present study was carried out in randomly selected 300 patients admitted in various trauma dealing departments of Acharya Vinoba Bhave Rural Hospital (AVBRH), Sawangi, Wardha (M.S.) during the period of July 2014 to September 2016. After analyzing the data, following observations were made.

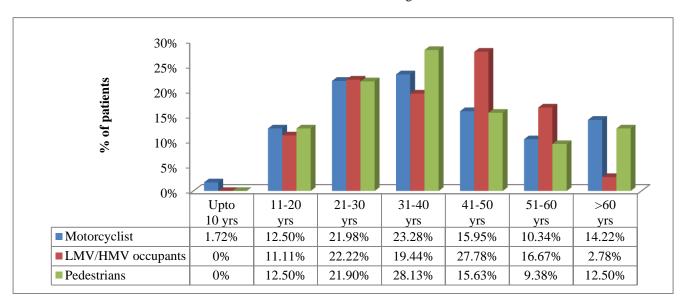


Figure 1: Age wise distribution of patients in different road user categories.

The maximum incidence of RTA was seen in males (80.67%) with working age group 21-40 years (64.66%). Most common road user category affected by RTA was motorcyclists (77.3%) followed by LMV/HMV occupants (12%).

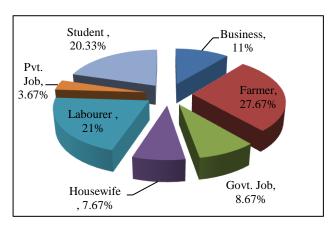


Figure 2: Distribution of patients according to their occupational status.

Occupation wise, Farmers were most commonly affected (27.67%) followed by laborers (21%). The most common duration of road accidents was between evening 4 pm to night 12 am. (57.33%). Most of the accidents occurred on Sunday (22.3%) followed by Saturday (16.33%).

Season has been implicated as an important factor for the occurrence of RTA. In our study, summer was the season when majority of RTAs occurred (52.67%).

The mode of collision, most commonly was frontal impact in cases motorcyclists and LMV/HMV occupants. (44.83% and 52.78%, respectively). Pedestrians showed bumper impact as most common mode of collision (58.06%).

In present study extremity injury was found to be most common type of injury (67%). The second most common body part affected was head region (58.33%).

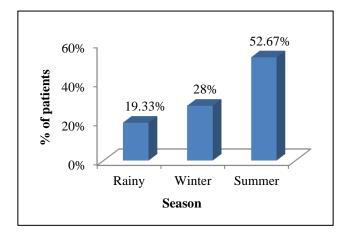


Figure 3: Distribution of patients of RTA according to season.

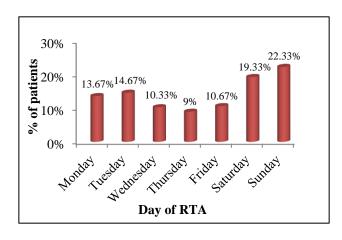


Figure 4: Distribution of patients according to day of RTA.

Type of injury	Road users						Total		
	Motorcyclist		LMV/HMV occupants		Pedestrians		Total		×2-value
	N	<b>%</b>	N	%	N	<b>%</b>	N	<b>%</b>	
Craniocerebral injury	131	56.47	24	66.67	20	62.50	175	58.33	1.59 p = 0.45, NS
Abdominal injury	14	6.03	1	2.78	1	3.13	16	5.33	1.00 p = 0.60, NS
Thoracic injury	18	7.76	6	16.67	1	3.13	25	8.33	4.50 p = 0.10, NS
Spinal cord injury	1	0.43	5	13.89	0	0.00	6	2.00	29.52 p = 0.0001, S
Pelvic injury	0	0.00	5	13.89	0	0.00	5	1.67	37.28 p = 0.0001, S
Extremity injury	164	70.69	19	52.78	18	56.25	201	67.00	6.39 p = 0.041, S

Table 1: Distribution of patients according to type of injury.

#### **DISCUSSION**

A total of 300 patients were accounted for the study. Majority of patients were males of working age group. This is in concordance with other studies. Thus, accident impacted the most productive age group with devastating consequences for family. Reckless driving and speeding in this age group is responsible for most of the accidents. The most common type of road user affected was motorcyclists (77.3%) in our studies and similar results were drawn from other studies. Regions like our study area are not well developed and the economic status is fair. Hence, cheaper motor vehicles are commonly in use.

Since, the region of our study is farming oriented area, most commonly affected individuals were farmers (22.67%). Such results of most RTA incidences in farmers and related personnels are also evident in other studies. <sup>13,14</sup>

Most common time of incidence of RTA was the evening and night time till 12 o'clock. Similar findings were drawn by various authors. <sup>15,16</sup> This can be attributed to hurry to get back to home after completion of their work, poor light conditions and fatigue dur to all day long work.

Weekends are usually the days of week when occurrence of RTA has been seen. In our study Sunday was the most common day of occurrence (22.33%) followed by Saturday (19.33%). Such findings were seen in other studies also. <sup>17,18</sup>

Season and associated environmental conditions plays an important role in RTAs. In this study, summer was the season when majority of RTAs occurred (52.67%). Moreover, mode of collision in form of frontal impact was most commonly seen in motorcyclists & LMV/HMV occupants. Pedetrians were hit by bumper impact commonly. Such findings were also depicted by many authors. <sup>19-21</sup>

With such types of collision, most commonly injured body part was extremity followed by head (67% and 58.33%) respectively. Such findings were evident in various national and international studies. <sup>7,22,23</sup> Such injury pattern can be attributed to poor road traffic knowledge, lack of usage of safety measure and poor and cheap vehicle designs.

### **CONCLUSION**

Road traffic accidents are an emerging problem in our nation. The most commonly affected are males in a young age group, which means that lives of many families are irrevocably changed by these mishaps. Motorized two wheelers are the offending vehicles in most cases. Strict laws regarding speed limit, use of safety belts and helmets together with better quality roads and roadside illumination will go a long way in

preventing such tragedies. A multi-disciplinary approach consisting of public education, a proper pre-hospital trauma care system and definitive trauma care facilities coupled with rehabilitation is required to be put in place if any impact is envisaged on this ever growing epidemic on the roads.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

institutional ethics committee

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**Cite this article as:** Lilhare S, Swarnkar M. A study of injury characteristics in road traffic accidents by different road user category. Int Surg J 2017;4:395-9.