

## Original Research Article

# A study on injuries of road traffic accident victims attending a tertiary care hospital, Tirupathi

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## ABSTRACT

**Background:** Rapid motorization brought a boon along with the curse of road traffic accidents toll. Injuries and deaths due to road traffic accidents (RTA) are one of the major public health problems across the globe especially in developing countries due to lack of comprehensive legislative measures. It will have immeasurable impact on the families affected by RTAs.

**Methods:** A hospital based, cross sectional study with victims of road traffic accidents admitted in S.V.R.R. Government General Hospital, Tirupathi, as study subjects was done during June 2013 to May 2014 for one year where 820 victims of road traffic accidents were interviewed after taking prior consent using a predesigned questionnaire.

**Results:** External injury was seen in almost all cases (97.9%) and 61.5% suffered grievous injury. Laceration, fractures and abrasion are the most common types of injuries found. Regarding anatomical sites, head injury is the commonest (68.8%). Majority of the victims suffered grievous injury during 6AM to 12 PM (66.2%). The proportion of grievous injury was most commonly found in victims who were hit by Unknown vehicle (84.6%).

**Conclusions:** Road side medical assistance by their timely action can prevent the toll of RTA fatalities and disabilities. Studies on injuries help in developing improved personal protective gear and safety measures inside the vehicles through novel engineering technology.

**Keywords:** Road traffic accident. Road user. Grievous injury. Head injury

## INTRODUCTION

Globalization has brought development in the field of automobiles followed by curse with rise of road traffic accidents. Injuries and deaths due to road traffic accidents (RTA) are a major public health problem in developing countries where more than 85% of all deaths and 90% of disability-adjusted life years were lost from road traffic injuries. Road traffic injuries in developing countries mostly affect pedestrians, passengers and cyclists as opposed to drivers who are involved in most of the deaths and disabilities occurring in the developed world.<sup>1</sup>

20 to 50 million sustain nonfatal injuries as a result of road traffic accidents. These injuries and deaths have an immeasurable impact on the families affected.<sup>2</sup> There is no comprehensive legislation on five key risk factors for road traffic injury which include speeding, drink-driving, use of motorcycle helmets, seat-belts and child restraints in any of the South-East Asia region countries.<sup>3</sup> Road traffic injuries cause considerable economic loss to victims, their families, and to the nation as a whole which include cost of treatment, decreased or lost productivity (wage loss) of the victims. For family members the effect is in terms of loss of work time while taking care of the

injured.<sup>4</sup> The global road safety 2013 report also stresses the importance of good post-crash care, both in terms of providing quick access for road traffic victims to health care, and in ensuring the quality of trained hospital trauma care staff in mitigating the negative outcomes associated with road traffic crashes.<sup>2</sup>

### Objectives

The objectives of the study were to find out the type of injury of the victims of RTA; to determine the ICD classification of RTA injuries; to study the association of type of injury with type of road user and mode of RTA.

### METHODS

A hospital based, cross sectional study with victims of road traffic accidents admitted in S.V.R.R. Government General Hospital, Tirupathi, as study subjects was conducted for a period of one year from June 2013 to May 2014. All road traffic accident cases admitted for at least more than 24 hours were included into the study. Exclusion criteria include victims of road traffic accidents admitted for less than 24 hours, Cases treated on outpatient basis and not admitted into hospital, victims who were immediately referred to higher centre, in case of unconscious patient and if the family members are not willing to participate, cases not willing to participate in the study. Study was conducted at departments of Emergency, Surgery, Orthopedic and Neurosurgery at S.V.R.R. Government General Hospital, Tirupathi after obtaining approval from institutional ethical committee.

A pilot study was conducted for a period of one month during May 2013 by using a pre-designed questionnaire and necessary corrections were made. A total of 820 cases of road traffic accidents reported to the Emergency, Surgery, Orthopedic and Neurosurgery units of S.V.R.R. Government General Hospital at Tirupathi were interviewed after taking prior consent using a predesigned questionnaire. In case if patient is not in a situation to respond, information was collected from family members, relatives, or friends. Data was entered into MS excel and analyzed using Epi-info TM 7.1.3.10 version software and appropriate statistical tests of significance were employed like Chi-Square test for significance of difference in proportions.

### RESULTS

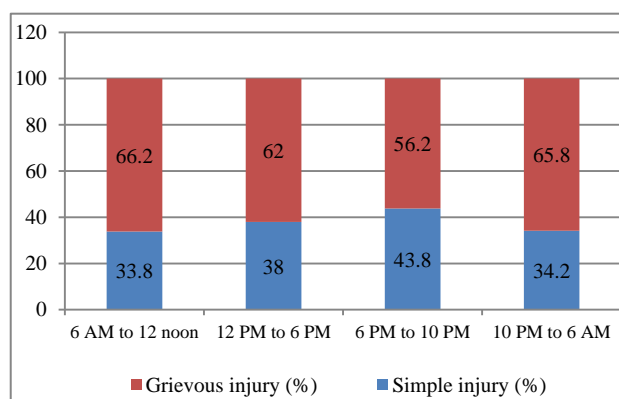
External injury was seen in almost all cases (97.9%) and the injury grade was in majority of cases, grievous type (61.5%) (Table 1). The common types of injuries were found to be laceration (73.5%), fracture (52.8%) and abrasion (50.1%) respectively (Table 2). Some may have more than one type of injury. Head injury is commonest (68.8%) followed by knee, lower leg (32.7%) and shoulder, upper arm (23.9%). Multiple body regions were involved in 4.3% of cases (Table 3).

**Table 1: Distribution of cases based on external injury and type of injury.**

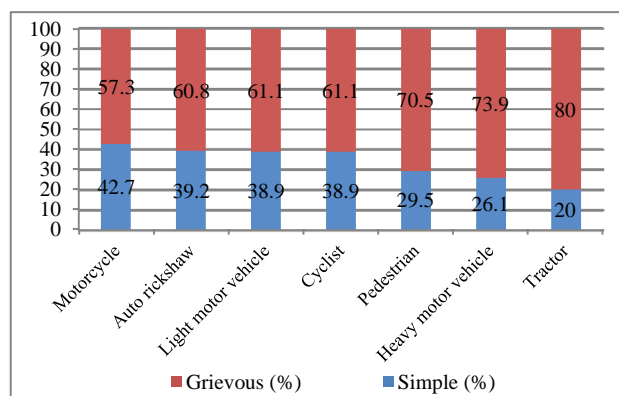
S. No.	Variables	Number of subjects	Percentage (%)
<b>1.</b>	<b>External injury</b>		
	Present	803	97.9
	Absent	17	2.1
<b>2.</b>	<b>Type of injury</b>		
	Simple	316	38.5
	Grievous	504	61.5

**Table 2: Distribution of cases based on type of mechanical injury (N=820).**

S. No.	Type of mechanical injury	Number of cases	Percentage (%)
<b>1.</b>	Laceration	603	73.5
<b>2.</b>	Fracture	433	52.8
<b>3.</b>	Abrasion	411	50.1
<b>4.</b>	Crush injury	63	7.7
<b>5.</b>	Contusion	41	5.0
<b>6.</b>	Avulsion	18	2.2
<b>7.</b>	Dislocation	10	1.2



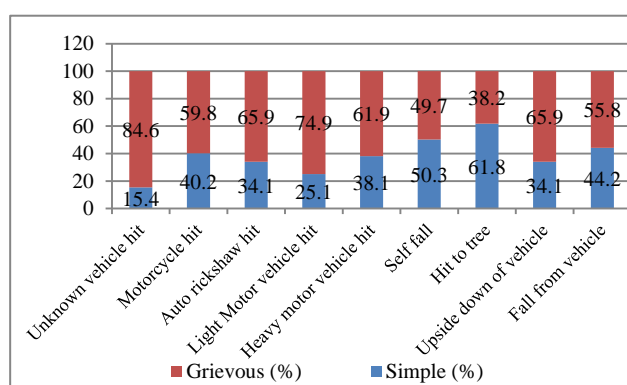
**Figure 1: Type of injury vs. time period of day.**  
 $\chi^2=5.15$  df=6; p=0.52; NS.



**Figure 2: Type of injury vs. type of road user.**  
 $\chi^2=11.9$  df=6; p=0.06; NS.

**Table 3: Distribution of cases based on type of mechanical injury (N=820).**

S. No.	ICD code	Site of injury	N	%
1.	S00-S09	Injuries to the head	564	68.8
2.	S10-S19	Injuries to the neck	9	1.1
3.	S20-S29	Injuries to the thorax	49	6.0
4.	S30-S39	Injuries to the abdomen, lower back, lumbar spine and pelvis	27	3.3
5.	S40-S49	Injuries to shoulders and upper arm	196	23.9
6.	S50-S59	Injuries to the elbow and forearm	141	17.2
7.	S60-S69	Injuries to wrist and hand	79	9.6
9.	S70-S79	Injuries to the hip and thigh	41	5.0
10.	S80-S89	Injuries to the knee and lower leg	268	32.7
11.	S90-S99	Injuries to ankle and foot	81	9.9
12.	T00-T07	Injuries involving multiple body regions	35	4.3
13.	T08-T14	Injuries to the unspecified parts of trunk, limb or body regions	5	0.6

**Figure 3: Type of injury vs. mode of road traffic accident.**

$\chi^2=35.2$  df=8;  $p<0.001$ ; S.

Majority of the victims suffered grievous injury during 6 AM to 12 PM (66.2%) followed by 10 PM to 6 AM (65.8%), though there is no statistical significant difference in their proportions (Figure 1). The proportion of grievous injury was most commonly found in relation to tractor (80.0%) followed by heavy motor vehicle (73.9%) and lowest with regard to motorcycle (57.3%) (Figure 2). The proportion of grievous injury was most commonly found in victims who were hit by Unknown vehicle (84.6%) (Figure 3).

## DISCUSSION

The common types of injuries were found to be laceration (73.5%), fracture (52.8%) and abrasion (50.1%) respectively in the present study. Similar observation was made in a study at Hapur.<sup>5</sup> Whereas in a study conducted at Kolkata, 68.44% had fractures, 28.64% had head injury, while 19.91% had abrasion, bruise, hematoma and visceral injury.<sup>6</sup> Likewise some studies reported that fractures is the most common injury afflicted to the victims.<sup>7,8</sup>

According to ICD-10, it was found that head injury is commonest (68.8%) followed by knee, lower leg (32.7%)

and shoulder, upper arm (23.9%). Similar observations were observed in studies where head and neck, upper and lower limb injuries constituted 66%, 44% and 41% respectively.<sup>9-11</sup> In contrast some studies found that the site of the body mostly injured was musculoskeletal extremities.<sup>7,8,12-14</sup> The proportion of grievous injury was most commonly found in victims who were hit by Unknown vehicle (84.6%), followed by light motor vehicle (74.9%), auto (65.9%) and the differences in proportions was found to be statistically significant.

## CONCLUSION

Majority of the victims has suffered grievous injury which reflects the intensity with which the RTA has occurred. Head injury is found to be most common during the road traffic accidents. Depending on the severity, it may land up into fatal accident. Most of the injuries were grievous in nature where the victims were hit by an unknown vehicle. Further accidents occurred during morning peak hours were found to have more of grievous injuries, may be due to increased traffic during day time. Similarly accidents during late night hours were also found to have more grievous injuries. Probably as it is resting time, drivers would be drowsy and low level of alert condition.

## Recommendations

Attitude of the road users along with the condition of the road plays a major role in prevention of RTAs. Further fatal RTAs force the family of the victim into indebtedness due to loss of wages or loss of life of the breadwinner for the family. Road side medical assistance on the national and state highways can curb down the fatality and also the chance of victim getting disabled by their timely action in the management during the golden hour. Studies on injuries help in predicting the vulnerability of body parts to get injured during RTAs and therefore can help in developing innovative personal protective equipment and safety measures inside the vehicles through novel engineering technology.

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